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TRANSACTIONS

OF THE

WORCESTER COUNTY

HORTICULTURAL SOCIETY.

REPORTS OF THE OFFICERS

FOR THE YEAR ENDING NOVEMBER 1, 1898,

AND

BY-LAWS.

Worcester, Mass.
PRESS OF CHARLES HAMILTON.
311 MAIN STREET.
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26036

WORCESTER COUNTY

HORTICULTURAL SOCIETY,

For the Year Ending Nov. 1, 1898.

ANNUAL REPORT OF THE SECRETARY.

To the Members of the

Worcester County Horticultural Society:

In presenting the Annual Report for this year, I desire to refer to some of the conditions which have prevailed that are unusual, and which have been beneficial to some varieties of Fruit, Flower and Vegetable, and exceedingly detrimental to others.

This season has been unusually long, nearly seven months having passed without frost, and with an unusual amount of rain.

The vegetables which have been exhibited have been unusually fine, and the number of exhibitors has largely increased; this latter fact being true of every department which this Society recognizes.

We stated last year that our honored President showed Rhubarb of which twelve stocks weighed 22½ lbs., thinking it a remarkable production, but this year he presents for our consideration the same amount which weigh 24½ lbs., and this is but one of the many instances where vegetable growth has eclipsed all former records.

The show of Strawberries, early in the season, was uneven, and did not give promise of average size or quality, but later on they proved as good as any that have heretofore graced our tables.

Of Apples there has been but about a third of the usual crop for the bearing year, and the quality has not been as good as usual. Our Exhibitions have been large, and many fine specimens have been shown. Of Baldwins alone there were forty exhibitors.

While this is not the bearing year for Pears, of some varieties, we have been surprised and pleased at the showing made. Of Sheldons alone there were 41 plates exhibited, and some of enormous size. One of our members, Mr. Arthur J. Marble, showed a Sheldon which weighed 17½ ozs., while Hon. George K. Nichols, of Grafton, sent in a Sheldon pear which weighed 23¼ ozs. There were 27 exhibitors of Bosc pears, and they were as fine as we have ever had. There was a good showing of other varieties, and the number of those competing was larger than ever before.

On the 13th day of October, the Worcester Agricultural Society, to preserve their rights to State Bounty, and to keep good the privileges granted by their charter, united with this Society in an exhibition. The display of fruits, flowers and vegetables was the largest ever shown in our Hall, and were as fine as were ever shown in this section. The display of hot-house grapes and ornamental plants, from the greenhouses of Mr. G. Marston Whitin, of Whitinsville, were exceedingly fine, and added no little to the success of the exhibition. It was rather late in the season for an exhibit of Mushrooms, but Miss Mary E. Atherton showed 86 varieties, and our judge in that department pronounced it a very creditable exhibition, particularly for so late in the season. The interest in this field, which is practically new with us, is increasing, and at nine of our exhibitions during the season they were shown, even when not on our schedule or any premium offered. At this exhibition a dinner was served, at which nearly 150 persons sat down. It seemed a very popular feature of the show, and I would recommend that in future this Society consolidate their October exhibitions, having but one that month, keeping it open from 10 A. M. to 9 P. M., and having a dinner served, as was done this year.

I am of opinion that such a course would add to the interest,

and bring to our Society many new members from the surrounding towns. This question is one to which I invite your careful consideration.

While this has been a very poor year for the cultivation of Sweet Peas—which after July were a failure, Asters and Dahlias—which were very late in blooming, it has been a specially good year for Tuberous Begonias and for Wild Flowers. At one show we had thirteen exhibitors of Wild Flowers, none showing less than sixty varieties, while some placed upon exhibition from ninety to one hundred.

Of our winter meetings I would say they were very interesting and largely attended; those which were illustrated by the stereopticon being attended by enough people to fill our main hall. Inasmuch as the essays are in print, and so far as applied for in your hands, there is no necessity for me to make a review of them in this report.

As last year, the Market Gardeners had the use of our library for their meetings, at which valuable papers pertaining to their business were read, and the Massachusetts Fruit Growers held their annual convention in the hall. Both of these societies have voted their thanks to this Society for its courtesies to them.

I desire to place upon record an acknowledgment to those who, during the past year, have materially added to the success of our exhibitions by furnishing us with useful and decorative materials without any apparent expectation of reward, only that they recognize this as one of the institutions which deserve whatever of success it has attained.

At the time of our Chrysanthemum exhibition the Clark, Sawyer Company furnished us with jardinieres, large vases, silver, glass and china ware, and at all times have willingly loaned from their stock anything of which we stood in need. The John C. MacInnes Company has furnished table linen and decorative materials on several occasions, and has always seemed to take an interest to assist us with whatever we needed in their line. Messrs. O. S. Kendall & Son set up for us four mantels, simply to add to the beauty of our exhibition and make more attractive our distribution of flowers.

The annual meeting of the Society was held Wednesday, November 3, 1897; President O. B. Hadwen presiding.

The election of officers was first in order, a list of whom will be found on the covers of the various publications of the Society.

Reports of the Treasurer, Librarian and Secretary were read, approved, and referred to the Committee on Publication.

Under the head of new business, the following letters were read:

12 Jefferson St., Worcester, *November 1, 1897.*

Mr. A. A. Hixon,
Secretary Horticultural Society.

Dear Sir:—The School Garden Committee of the Civic Club respectfully ask the assistance of the Horticultural Society in encouraging the development of the school gardens of our city.

Much has already been done in this direction by teachers, pupils and friends, and your Society is earnestly requested to arouse greater interest in the subject by offering prizes for the best garden display of Tulips, Hyacinths and the like, and also for the best display of bedding plants. If the Society or individuals thereof can conveniently contribute bulbs, shrubs, etc., credit therefor will be given. I hope that in the interest of the children this request will be acted upon favorably by the Horticultural Society, for I can safely assert that such action will be far reaching in its beneficent results and will be appreciated.

Yours, Very Truly,
JOHN E. LYNCH,
Chairman Garden Committee of Civic Club.

Clark University, Worcester, Mass.

Mr. Adin A. Hixon, Secretary.

My Dear Mr. Hixon:—Last April you will remember my speaking to you on the matter of the Horticultural Society offering prizes of some sort to school children for the cultivation of flower plants. You regretted at the time that, since the appropriations had been made for the year, nothing could be done until this fall. The experiment as tried in the Upsala St. School last spring may provoke a smile on the

part of some veteran horticulturists, but it demonstrated both the feasibility of the plan, in the interest it awakened among both children and parents, and the need of such practical school work in certain sections of the city.

Since I have only a few moments to write, I will ask you to also bear in mind a discussion of the subject which we enjoyed for a good part of an afternoon in October.

The points upon which we seemed to be agreed at the time are as follows:

1. In no better way can the Horticultural Society stimulate interest in its work throughout the entire city than by coming into the most helpful relations possible with the children and teachers of the public schools.
2. The natural result of such mutual relations should be that more young people, as they become interested, would wish to join the Society.
3. That, in the coming annual appropriations, the Society should devote a certain sum to be used as prizes to children in the public schools for the plant or plants, the species to be designated by the Society, which, raised entirely by the child, exhibits the best culture.

My plan is to have the prizes of the Horticultural Society come in to "cap out" similar work in the individual schools. For example I have personally offered certain prizes in the Upsala St. School. I hope that others may do the same for other schools. Now let the Society's prizes be given to the winners in each class from all the schools. Of course, the Society might put smaller prizes into the individual schools, if thought best.

If I can be of any assistance to you or the Committee of Appropriations, as you suggested that I might be, in arranging the details of these prizes, I am at your service.

Yours, very truly,

C. F. HODGE.

3 Charlotte St., *Nov. 1, 1897.*

Considerable discussion followed without any definite plan being offered. It was

Voted to refer the matter to the Trustees.

The question of revising the By-Laws was next considered.

The importance of the question demanding more time than could be allowed this day, it was

Voted, to adjourn to Wednesday, November 17, 1897, 10 o'clock, A. M.

The annual meeting of the Trustees was called immediately upon the adjournment of the meeting of the Society; President O. B. Hadwen presiding.

The first business was the election of committees and judges, a list of which will be found with the officers.

Votes of thanks were tendered the judges, Henry Phelps, William A. Wood, and Charles Greenwood.

Voted to appropriate the following sums for premiums:

Flowers and Plants, ...	$700 00
Fruit, ...	600 00
Vegetables, ...	400 00

with the addition of $300 to be divided between the different departments; $50 to be devoted to Native Mushrooms.

Voted to appropriate for

Winter Meetings, ...	$300 00

Hon. Henry L. Parker, Henry B. Watts, John B. Bowker, with the President and Secretary, were appointed a committee to arrange for them.

Voted to appropriate for

Library and Publications, ...	$250 00

with an additional sum to bind all unbound books.

Letters from John E. Lynch, of the Civic Club, and Dr. C. F. Hodge, of the School Board, were read and laid on the table until the next meeting.

No other business offered, it was voted to dissolve.

The adjourned annual meeting was held on Wednesday, November 17, 1897, 10 o'clock A. M.; President O. B. Hadwen presiding—

To act upon proposed amendments to or changes of the Constitution and By-Laws. After considerable discussion as to the

legality of some propositions the following changes and additions were adopted:

Proposals for membership shall be submitted to a Committee consisting of the President, Secretary, and the members of the Finance Committee, who shall consider the same and upon a vote of a majority of said Committee they may become members of the Society upon payment of five dollars for men and three dollars for women and signing the By-Laws of the Society.

Expulsion of Members. If any member shall reflect serious discredit upon the Society or shall be guilty of any breach of the rules of the Society, he or she may be expelled, two-thirds of the members present voting therefor. But no member shall be expelled unless a written notice of the motion be served by the Secretary upon the member personally or left at the member's usual place of abode, at least twenty days before it is acted upon.

All meetings of the Society shall be called by giving not less than one week's notice in at least one newspaper published in the City of Worcester and the Secretary shall notify by Postal Card each member as far as their address may be known.

At all meetings of the Society twenty-five shall constitute a quorum for the transaction of business.

At all meetings of the Trustees ten shall constitute a quorum for the transaction of business.

Librarian.

His Duties. The Librarian shall have charge of all the books, drawings, engravings, herbaria, and other articles appertaining to the Library, and shall attend to the purchase, recording, cataloguing, arranging, binding, delivering, and receiving of books; these duties to be performed under the direction of the Library Committee. He shall so far as possible assist those desiring to use the Library in their investigations.

Library Committee.

They shall adopt and enforce regulations for the Library and Cabinet which have been approved by the Society. These

regulations shall be affixed to every volume, and posted in the Library.

Voted to print the Constitution and By-Laws in the Transactions.

No other business presented it was voted to dissolve.

A meeting of the Trustees was held immediately upon the dissolution of the society's meeting; President O. B. Hadwen presiding.

This meeting was called at the request of F. J. Kinney and others who were desirous that the Horticultural Society should be among others who were contributing works of art to the Worcester Art Museum.

It was voted to appropriate one hundred and fifty dollars for the purchase of Casts from the Parthenon Frieze. A letter tendering the gift was sent to T. H. Gage, Jr., Secretary of the Worcester Art Museum; in acknowledgment the following letters were received.

Worcester Art Museum.

Mr. Adin A. Hixon,

Secretary of the Worcester County Horticultural Society.

Dear Sir:—I am in receipt of your letter of Nov. 18, 1897, presenting the Worcester Art Museum with a Cast of the Parthenon Frieze. I beg to assure the Horticultural Society of the grateful acceptance of the gift by the Worcester Art Museum.

You may expect to receive a more formal recognition of gratitude from the Chairman of the Committee on the Museum.

Very truly,

T. H. GAGE, Jr.,

Secretary.

Nov. 18, 1897.

Central Church Parsonage.

Worcester, *Nov. 20, 1897.*

Mr. Adin A. Hixon,

Dear Sir:—As Chairman of the Committee on the Museum, the agreeable duty devolves on me of communicating to the Worcester County Horticultural Society the hearty thanks of the Directors of the Worcester Art Museum for their superb gift of Casts from the Parthenon Frieze.

No casts are more desirable than these, and they will prove a great

and permanent enrichment to the Museum, for which the Directors are extremely grateful.

With much respect, Yours sincerely,
HELEN B. MERRIMAN.

The letters of Dr. Hodge and John E. Lynch were taken from the table. After some discussion it was voted to postpone action to a later meeting.

Voted to dissolve.

A meeting of the Trustees, legally called, was held December 16, to consider the advisability of holding a Chrysanthemum show in November, 1898.

After considerable discussion it was voted to tender the use of the hall to the florists, free of charge, for a Chrysanthemum show. Discussion followed. It was voted to refer the matter to the Committee on Arrangements and Exhibitions, to arrange a schedule for a Chrysanthemum show, and report to the Trustees for their approval.

Voted to pay the premiums as awarded for season of 1897.

Voted to make the combined premiums for fruit, flowers and vegetables for 1898, $2,100 instead of $2,000.

Hon. Henry L. Parker informed the Society that by the will of William Eames they would receive a legacy of five hundred dollars for the promotion of apple culture, to be known as the Eames Fund. Voted to accept the same, and the thanks of the Society extended to his sister, Miss Mary R. Eames, for making it immediately available.

Received from Miss Mary R. Eames a picture of her brother, William Eames, which was accepted with a vote of thanks to Miss Eames.

No other business presented, it was voted to dissolve.

A special meeting of the Trustees, legally called, was held Monday, December 27, to act upon the report of the Committee on Arrangements and Exhibitions as to holding a Chrysanthemum show, and appropriations necessary for the premium list.

Voted to hold a Chrysanthemum show, and to appropriate $200 and the door receipts for the premium list.

Voted not to advertise the show in the papers.

Voted to pay the railroad expenses of George McWilliams, Judge of Flowers.

Voted, as no definite plan could be decided upon in the matter of offering prizes to school children, as proposed in the letters received from Dr. C. F. Hodge and John E. Lynch, to lay it on the table indefinitely.

Voted that the President, Secretary and Judge of Flowers constitute a committee to decide who are florists and amateurs.

No other business offered, it was voted to dissolve.

In reference to the letters received from Dr. Hodge, of the School Committee, and Mr. Lynch, of the Civic Club, your Secretary does not see any practical way for this Society to move in the matter. The school children rarely attend any of our exhibitions, even when invited to do so specially or in the general invitation for any one interested to be present.

Then, again, until such time as some of the scholars of our public schools exhibit something, either wild flowers, when scheduled, or any plant, trusting to our system of gratuities for their reward, I can see no reason why we should attempt to force upon them the planting and care of flowers when during the period when they should receive the most attention the scholars are enjoying their long vacation and would not devote that time to either the theory or practice of horticulture.

There does seem to be a call among our members for some instruction in botany, the arranging of flowers and a more thorough understanding of the science of grafting and budding of trees, and I would recommend that on Saturday afternoons such instruction be given in the library to such as care to attend, whether members of the Society or not, and that this matter be placed in the hands of the Committee on Winter Meetings for such action as they deem best for the good of all interested in the subjects named.

Received from Arthur J. Marble, a portrait of his father, Freeman M. Marble, with the following letter:

WORCESTER, MASS., Feb. 24, 1898.

ADIN A. HIXON, Secretary Worcester County Horticultural Society:

Dear Sir:—I herewith present to the Horticultural Society a por-

trait of the late Freeman M. Marble, for many years a member, and for twenty-five years a trustee of the Society. I feel that to the many friends he had in the Society, it will be a pleasure to see his portrait on the walls, and that it is a fitting tribute to his lifelong interest in the Society.

Very sincerely yours,

MRS. FREEMAN M. MARBLE.

A letter accepting the portrait, with thanks, was sent to Mrs. Marble.

Received from our President, O. B. Hadwen, three paintings, which have been placed in our rooms.

In conclusion, I desire to thank the officers and members of the Society for their hearty co-operation.

Respectfully submitted,

ADIN A. HIXON, *Secretary*.

HORTICULTURAL HALL, WORCESTER, MASS.,
November 3, 1898.

Since publishing the membership list July 1, 1897, the following have been added:

B. J. Bertels,	Worcester.	Mrs. Isaac Hildreth,	Worcester.
Annie E. Brierly,	"	Bertha Hardy,	"
Mrs. G. M. Bullard,	"	Lilian A. Jones,	"
John F. Bartlett,	"	Carrie W. Jones,	"
Edward W. Breed,	Clinton.	Annie E. Jones,	"
Ledyard Bill,	Paxton.	Mrs. Lillie R. Kinney,	"
Mrs. J. A. Balcom,	Northboro.	Oran A. Kelley,	"
Charles E. Bond,	Worcester.	Mrs. Oran A. Kelley,	"
E. F. Corey,	Northboro.	F. E. Lawrence,	Northboro.
Zelotes W. Coombs,	Worcester.	Mrs. Marcella Maynard,	"
Mrs. F. B. Davidson,	"	Mrs. Kate E. Parker,	Worcester.
J. Warren Ellsworth,	"	Clara B. Rood,	"
Mrs. William A. Green,	"	Emma L. Taylor,	"
Mrs. Frank W. Haynes,	"	Frank H. Warner,	"
John B. Hunt,	"	Elizabeth T. Weir,	"
Frank A. Harrington,	"	A. S. Wolfe,	Auburn.
Edward W. Higgins,	W. Boyls'n.	George N. Newhall,	Worcester.
George M. Houghton,	Worcester.	Mrs. Charles E. Neale,	"

The following deaths have occurred since July 1, 1897:

H. J. Allen.
Alzirus Brown.
Elbridge Boyden.
F. J. Boyden, Leominster.
Albert Curtis.
E. D. McFarland.
W. E. Hadwen.
E. B. Hamilton.
Benj. James.
John D. Lovell.
E. L. Brigham.
T. L. Nelson.
Charles B. Pratt.
Edward Proctor, Spencer.
Mrs. Sumner Pratt.

November 1, 1898.

REPORT OF THE LIBRARIAN.

To the Members of the

Worcester County Horticultural Society.

The Library has been open nearly every day the past year, proving a convenience for those who wish to consult the books and having only a limited time. The interest shown among the younger members for books on birds has been supplied by the addition of several.

The following Books, Periodicals, Papers and Bulletins have been added to the Library during the year :—

United States Department of Agriculture : Library Bulletin. Accessions to the Library from July 1, 1897, to June 30, 1898.

Catalogue of the Publications for sale by the Superintendent of Documents, corrected to Oct. 1, 1897.

Library Bulletin : Reference list of publications relating to edible and poisonous mushrooms, compiled by Josephine A. Clark, Assistant Librarian, 1898.

Bulletin : Some common birds, in their relation to Agriculture. F. E. Beal, 1897.

Bulletins : Twenty-two numbers, 1897, from Hon. Joseph H. Walker.

United States Civil Service Commission. Report, July, 1896, to June, 1897.

United States Department of Pomology. Catalogue of Fruits, recommended by the American Pomological Society, 1897.

Field Columbian Museum. Report of the Director for 1896 and 1897.

Botanical Series. Part 4, Vol. 1.

Lake Mohawk Conference on International Arbitration. Fourth Annual Meeting Report.

Maryland Agricultural Experimental Station. Reports; 77 in all; complete set. Robert E. Browning, Librarian.

Report on the San Jose Scale, August, 1898. W. G. Johnson. Twelve copies for distribution.

Michigan Board of Agriculture. Report, 1896.

Michigan Agricultural Experimental Station. Bulletins, Nos. 154 to 161 inclusive.

Cornell University Agricultural Experimental Station. Bulletins, Nos. 139 to 151 inclusive.

Bulletin. Farmers' Reading Lesson. First Lesson.

Connecticut Board of Agriculture. Report, 1896. T. S. Gold, Secretary.

West Virginia Agricultural Experimental Station. Bulletins, Nos. 49, 50, 51.

Arkansas Agricultural Experimental Station. Bulletin, No. 49.

Massachusetts Board of Agriculture. Report, 1897. William R. Sessions, Secretary. Twenty copies for distribution.

Massachusetts Crop Reports. Bulletins, Nos. 1 to 6 inclusive. Series of 1898.

Massachusetts Agricultural College. Hatch Experimental Station. Bulletins, Nos. 49 to 53 inclusive.

Meteorological Observatory. Bulletins, Nos. 104 to 118 inclusive.

Massachusetts Horticultural Society. Transactions. Part 3, 1895. Part 2, 1896. Parts 1 and 2, 1897.

Massachusetts Fruit Growers' Association. Reports, 1897, 1898.

Hingham Agricultural and Horticultural Society. Transactions. Full set. From Edmund Hersey.

Board of Trade, Worcester. Report, 1897.

Parks Commission, Worcester. Report, November 30, 1897.

Worcester Agricultural Society. Report, 1897.

Worcester Society of Antiquity. Town Records, 1845 to 1848. Bulletins, Nos. 1 and 2.

Worcester County Horticultural Society. Two volumes, bound, 1862 to 1870; 1871 to 1880. From Edward Winslow Lincoln.

Journal of Horticulture. Vols. 34 and 35, 1897. English.

Revue Horticole. French. 1897.

Silva of North America. Prof. Charles S. Sargent. Vol. XI.

Mushrooms of America. Students' Hand Book. Edible and Poisonous. Thomas Taylor, M. D. Pamphlet, Nos. 4 and 5.

Moths and Butterflies, 1898. S. F. Denton. Illustrated. Sections 1, 2, 3, 4.

Illustrated Flora of the Northern States and Canada. Vol. 3, 1898. Britton & Brown.

North American Birds. Illustrated. 1874. Baird, Brewer & Ridgway.

Hand Book of Birds. Eastern North America. Illustrated. 1895. Frank M. Chapman.

Birds of North America. Illustrated. 1896. Elliott Coues.

Gleanings on Bee Culture 7 vols. From Fred. A. Blake.

United States Department of Agriculture. Reports. From Miss Sarah A. Powers.

United States Department of Agriculture Reports and American Agriculturists. From Henry Lovell.

Amateur Flower Garden. 1839. Edward Sayers.

Gardening. Charles Marshall. Vol. 1, 1799.

Short Treatise on Horticulture. William Prince, 1828. From the American Antiquarian Society.

Insects Injurious to Vegetation. T. W. Harris, M. D. Exchanged for, with George E. Francis, M. D.

United States Department of Agriculture. Special Reports. Volume 1, 1877, to Volume 17, 1888. From Henry Phelps.

Inaugural Address. Rufus B. Dodge, Jr., Mayor. Jan. 3, 1898.

United States War Revenue Laws, 1898.

Worcester County Atlas.

Worcester City Directory.

Worcester City House Directory.

American Florist.

American Gardening.

Country Gentleman.

Florist Exchange.

Gardening.

New England Homestead.

Massachusetts Ploughman.

Meehan's Monthly.

Rural New Yorker.

State Board of Health Bulletin, Nashville, Tennessee.

Worcester Daily Spy.

Worcester Daily Telegram.

English:

Agricultural Gazette.
Garden.
Gardener's Chronicle.
Gardening Illustrated.

Respectfully submitted.

ADIN A. HIXON, *Librarian.*

Horticultural Hall,

November 1, 1898.

REPORT OF THE TREASURER.

THE Treasurer of the Worcester County Horticultural Society herewith presents his annual report for the year ending November 1, 1898.

The general business depression of the country has affected this Society as shown by the decreased income from the renting of our hall, but it is confidently hoped that with the expected revival of business in this section, another year will show increased receipts from this source.

Since the last annual meeting the treasurer has received from the estate of our late associate William Eames the sum of $500, which in accordance with a vote of the Society has been invested and will hereafter be known as the William Eames Fund.

The fire in the building adjoining our own has rendered necessary certain repairs, the expense of which has been nearly met by the amount received for insurance.

Our loss by the fire in the theature building was promptly adjusted by the payment to us of $419.

It is a cause of congratulation that the changes and improvements made in the upper part of our building were practically completed before the fire alluded to, for without much doubt they saved our property from destruction.

The past year has called for unusual expenses, owing to the changes and improvements made in the stores belonging to the Society, and these alterations made it necessary to incur other expenses for making safe entrance to our hall.

The expenditure for these purposes was about $10,000, but the increased rent received for our stores makes it a good investment.

This year, too, the insurance on the building and its contents had to be renewed at a cost of nearly $1,300; this was reduced by a rebate in the premium for insurance, brought about by the improvements I have referred to, about $300.

The extensive alterations and repairs made on our building the past year has involved the borrowing of about $13,000; of this amount $5,350 remains unpaid.

This is in addition to the mortgage loan, which now amounts to $8,900.

As will be seen by the detailed report, there is but a small amount of cash on hand; the annual premiums will soon have to be paid, so that it will be necessary to temporarily borrow more money, and the treasurer requests that he be given the necessary power, under the direction of the Finance Committee.

If the date for paying the premiums could be extended for a short period, say till the first of January, it would delay the time at which we should have to borrow and thus be a saving of interest, and the sum received in the meantime from the rent of the stores and hall would very materially reduce the amount we should have to borrow.

There should be some way devised to economize the current year in order that our debt should not be increased, but if possible reduced. I would suggest that it might be advisable to reduce the amount paid for premiums, certainly while the Society has to borrow money to meet the annual expenses and the interest on our loans.

It is probable that the maintenance of our building the coming year will not involve large expenditures, and the large item for insurance will not be needed.

As will be seen by the report the taxes for the past year have been more than for previous years, and with the greatly increased expenditures of the city will be likely to be higher rather than lower.

The detailed report of the receipts and expenditures is as follows:

NATHANIEL PAINE, Treasurer, in account with
WORCESTER COUNTY HORTICULTURAL SOCIETY.

1897.	DR.		
Nov. 1.	Balance as per last report,		$4,237.44
1898.			
Nov. 1.	Receipts to date:		
	From rent of stores,	$5,922.20	
	rent of hall,	3,865.25	
	membership fees,	94.00	
	Chrysanthemum exhibition,	107.00	
	Est. of William Eames,	500.00	
	insurance on building,	419.00	
	rebate on insurance,	308.07	
	For tickets to annual reunion,	170.00	
	interest on deposit in bank,	42.00	
	Money borrowed,	13,350.00	
Nov. 1.	Total receipts to date,		$24,777.52
	Total,		$29,014.96
1898.	CR.		
Nov. 1.	Payments to date:		
	City taxes and water bills,	$ 936.21	
	Premiums paid,	2,380.52	
	Paid judges of exhibits,	150.00	
	for gas,	781.50	
	A. A. Hixon, salary as secretary,	400.00	
	A. A. Hixon, as librarian, &c.,	999.96	
	treasurer,	150.00	
	janitor,	458.33	
	A. A. Hixon, sundry expenses at Hall,	432.58	

Nov. 1.	Worcester Agricultural Society,	100.00	
	Worcester Art Museum,	150.00	
	Interest on loans,	644.29	
	For books and periodicals,	151.23	
	printing publications, &c.,	412.21	
	Repairs and alterations to building,	10,027.67	
	For coal,	91.71	
	Insurance premium,	1,298.15	
	Loans paid,	8,000.00	
	For fire extinguishers,	39.00	
	ordinary repairs,	129.91	
	Expense for annual banquet,	302.65	
	Deposited in Savings Bank (Eames Fund),	500.00	
	Incidentals,	239.07	
		$28,775.02	
1898, Nov. 1.	Cash balance,	239.94	
			$29,014.96

THE FRANCIS H. DEWEY FUND.

1897, Nov. 1.	Balance of fund,	$1,081.80	
1898, Nov.	Interest to date,	43.25	
1898, Nov 1.	Present amount of fund, invested in Savings Bank,		$1,125.05

THE WILLIAM EAMES FUND.

1898, Nov. 1.	Amount of fund,	$500.00

NATHL. PAINE, *Treas.*

November 1, 1898.

WORCESTER, Nov. 3, 1898.

We the undersigned, Auditors of the Worcester County Horticultural Society, hereby certify that we have this day examined the account of the Treasurer, and find the same to be correct and properly vouched, and that the cash balance is accounted for.

HENRY L. PARKER.
F. H. CHAMBERLAIN.

BY-LAWS

OF THE

WORCESTER COUNTY HORTICULTURAL SOCIETY.

REVISED AND ADOPTED NOVEMBER 17, 1897.

ANNUAL MEETING.

ARTICLE 1. There shall be an Annual Meeting of the Society to be held on the first Wednesday in November of each year.

MEMBERSHIP.

ARTICLE 2. Any member may propose candidates for membership to a Committee consisting of the President, Secretary and the members of the Finance Committee, who shall consider the same, and upon a vote of a majority of said Committee they may become members of the Society upon payment of five dollars for men and three dollars for women and signing the By-Laws of the Society.

EXPULSION OF MEMBERS.

ARTICLE 3. If any member shall reflect serious discredit upon the Society or shall be guilty of any breach of the rules of the Society he or she may be expelled, two-thirds of the members present voting therefor. But no members shall be expelled unless a written notice of the motion be served by the Secretary upon the member personally or left at the member's usual place of abode, at least twenty days before it is acted upon.

OFFICERS.

ARTICLE 4. The Officers of the Society shall consist of a President, three (3) Vice-Presidents, a Secretary, a Librarian, and a Treasurer—(all of whom shall be Trustees *ex-officiis*).

The Officers are to be elected by ballot, to hold their Offices until

the next annual election or until others are chosen in their places, and to discharge the duties of their respective offices.

MEETINGS OF THE SOCIETY.

Article 5. All meetings of the Society shall be called by giving not less than one (1) week's notice in at least one newspaper published in the City of Worcester and the Secretary shall notify by postal card each member as far as their address may be known.

Special Meetings of the Society shall be called by the Secretary at any time, on the application of five (5) members therefor. And at all meetings of the Society twenty-five (25) shall constitute a quorum for the transaction of business.

SECRETARY.

Article 6. His Duties: The Secretary shall keep records of all business transacted at the meetings of the Society and of the Trustees, and also of the admission of members, and he shall call and notify meetings of the Society and of the Trustees, and shall notify persons chosen to office in the Society of their election and the Committees of their appointment, and shall attend to the correspondence of the Society.

TREASURER.

Article 7. His Duties: The Treasurer shall, at each Annual Meeting of the Society, make a report of his receipts and expenditures on account of the Society, and the condition of its finances, and exhibit his accounts. And a Committee shall be annually appointed by the Trustees to examine and audit his accounts and to report thereon. The Treasurer shall give bonds to the acceptance of the Trustees of the Society for the faithful discharge of the duties of his office.

THE LIBRARIAN.

Article 8. The Librarian shall have the charge of all books, drawings, engravings, herbaria, and other articles appertaining to the Library, and shall attend to the purchase, recording, cataloguing, arranging, binding, delivering, and receiving of books; these duties to be performed under the direction of the Library Committee. He

shall, so far as possible, assist those desiring to use the Library in their investigations.

LIBRARY COMMITTEE.

They shall adopt and enforce regulations for the Library and Cabinet, which have been approved by the Society. These regulations shall be affixed to every volume, and posted in the Library.

TRUSTEES.

Article 9. Their Number: The Trustees shall consist of any number not less than twenty-five (25) exclusive of the officers, who are trustees *ex-officiis*—and the exact number of Trustees for the year ensuing, shall be determined at each Annual Meeting.

Their Powers: The Trustees shall have the general charge and direction of the affairs and business of the Society, its funds and property, so far as not otherwise provided for in the By-Laws or at the meetings of the Society; and may appoint one or more exhibitions of Flowers, Fruit or Vegetables in each year, and make all arrangements therefor and for conducting the same, including the appointment of Committees; and may establish premiums and provide for awarding the same, and shall direct the disposal of all articles of a vegetable growth which may be presented to the Society, including the distribution of Seeds, Scions and Cuttings, Layers and Roots.

Their Meetings—Quorum: At all meetings of the Trustees, ten (10) shall constitute a quorum for the transaction of business; and a meeting of the Trustees may at any time be called, on the application of three (3) members of the board to the President of the Society; and all meetings of the Trustees shall be called by the Secretary. There shall be stated meetings of the Trustees, to be held once in three (3) months.

FINANCE COMMITTEE.

Article 10. There shall be chosen at the Annual Meeting of the Society a Committee of three (3), one member thereof to be elected each and every year, to hold office for the term of three years; said Committee, subject to the control and supervision of the Society, shall have the general care and oversight of the lands, buildings and other property of the Society; shall approve all bills against the Treasury before being paid by the Treasurer, except money awarded for Pre-

miums; and shall authorize the Treasurer to invest for the benefit of the Society, in one or more of the Savings Banks of the City of Worcester, any money not appropriated or necessary for the current expenses of the Society.

AMENDMENTS.

Article 11. The By-Laws may be altered or amended at the Annual Meeting of the Society, by a vote of two-thirds ($\frac{2}{3}$) of the members present: provided, that previous notice shall have been given in the call for the Annual Meeting that the subject of an alteration of the By-Laws is to come before the Society at that meeting.

ADIN A. HIXON, *Secretary.*

November 17, 1897.

TRANSACTIONS

OF THE

WORCESTER COUNTY

HORTICULTURAL SOCIETY.

ESSAYS

FOR SEASON OF 1899.

Worcester, Mass.
PRESS OF CHARLES HAMILTON.
311 MAIN STREET.
1900.

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WORCESTER COUNTY
HORTICULTURAL SOCIETY.

5th January, A. D. 1899.

ESSAY

BY

O. B. HADWEN, President.

Subject:—Review of Horticulture.

It is a significant fact that the winter meetings and summer exhibitions keep the members in touch with the advancement of Horticulture.

The Society's Library of upwards of 3000 volumes is the second largest in Massachusetts. The books are among the costliest and most valuable upon Horticulture, and have proved of inestimable value to members. The library is also well supplied with weekly and monthly publications of this and foreign countries. Horticulturally speaking, the library is full of leaves abounding with fruit and flowers.

In its earliest history it was kept in the office of Anthony Chase, subsequently in the office of Clarendon Harris, and, in 1852, was removed to its present location in Horticultural Hall.

The Society was organized in 1840 and received its act of incorporation in 1842. The first exhibition was October 13, 1840, largely through the efforts of William Lincoln, and it proved as great a novelty as it did a great success.

Of those who were recorded as exhibitors, Andrew H. Green is the only one now living.

The succeeding exhibitions were migratory until the completion of Horticultural Hall. When incorporated the Society was

permitted to hold real estate to the amount of $1500, and personal property to the amount of $2000. Until 1850 the amount of funds received was $3611.52.

By the will of Hon. Daniel Waldo the Society was left $3000, and with the funds the land was bought on Front street for $6847.30, and the building erected for $11,278.25, making the total cost $18,125.65. The building has twice been altered and improved, at nearly double its original cost, until it is now adequate for all the needs of the Society. I am the only person living who contributed to the exhibition in 1841, also who attended the meeting at the office of Anthony Chase, County Treasurer, when the committee was chosen to buy the land and build Horticultural Hall. The members were Stephen Salisbury, Frederick W. Paine, William M. Bickford, William T. Merrifield, William Workman, Horatio N. Tower and D. Waldo Lincoln.

Lieut. HATHAWAY.

I CERTAINLY did not come here as a speaker, but as a listener. Horticulture, to your President, is like a school-book which he has learned from cover to cover. I stand here as one of the two living charter members of this Society. I feel that I have done something for this Society. That is, in the decoration of the window trimmings of this building. I was then engaged in terra cotta work, and these beautiful window trimmings were designed especially for this building. As you have probably noticed, they are a combination of fruits and flowers. I wish I could speak to you with the vigor that two-score years would give a man, but which four-score years will not allow a man to carry. Who can tell what makes the seed to grow? It is dropped into the bosom of the earth, and in a short time springs up and bears beautiful blossoms. So it will be with us. We will be laid in this earth only to rise up in the earth of immortality.

Rev. Mr. KENT.

You can take a minister by surprise sometimes, and your President has certainly taken me by surprise. I do not feel like talking to you on Horticulture when there are so many gentlemen here who can talk to you so much better than I can. In giving my talk on roses I only spoke of their relations to me. I had a dozen of my boys learn to solder, so that when their mothers' kettles needed mending they could solder them. When I lived in Illinois, there was a young man who came to take charge of a church there. It was a village with about 400 people and 600 pigs. The pigs and the people seemed to be very friendly with one another, they certainly shared the same door-yard. Well, when this young man came, he started a little garden in the door-yard. I believe that his flowers did more good and saved more souls than his preaching did. The next year the women wanted to make their door-yards look pretty, and commenced to build fences to keep the pigs out. The people improved very much after they ceased to associate with the pigs. And so your Society, by its exhibition of flowers, has done much to elevate the people.

EDWARD W. BREED, Clinton.

As we review Horticulture for the past few years, we find there have been many valuable additions made, although, in many instances, new varieties only serve to adorn catalogues. Their chief value lies in the fact that they are novelties.

There are, however, many desirable acquisitions, from which I have selected the following:

Trees.

Cornus Florida Rubra.—The flowers of this variety are a deep rose-color and are freely produced. The tree is a fit companion for the white flowering dogwood.

Larix Kaempferii.—This is a Japanese variety that makes a slow dense growth with light soft-green foliage. While it is not

as hardy as our larch, it is nevertheless worthy of our attention, and we should give it some slight protection.

Bechtel's Double Flowering Crab.—This is one of the most beautiful of the dwarf flowering trees. It blooms freely when quite small, and has flowers that are very fragrant and bright pink in color, intermixed with white.

Populus Alba Nivea.—This tree is an improved form of the white or silver poplar and very beautiful for the lawn, with the underside of its leaves white as snow.

Shrubs.

Berberis Neubertii.—This is a very attractive form of barberry, having holly-like leaves. It is a grand addition to this valuable family.

Deutzia Lemoinei.—The flowers of this variety are two-thirds longer than the well-known Gracilis, and when in bloom, cover the plant thickly. It is as well adapted for forcing as for planting in the garden.

Vibernum Tomentosum.—This is the single form of the Japanese snowball, and is said to be the finest variety of the Viburnum family. A little protection is advisable when the plants are small.

Philadelphus Avalanche.—This is a dwarf flowering form of the old-fashioned syringa. It has weeping branches, and when in bloom, resembles a fountain. Its flowers are pure white and fragrant.

Stephenandra Flexuosa.—This is a new shrub from Japan, of low, dense growth, having deeply cut foliage that is the attractive feature of this shrub.

Ligustrum Ibota.—The above is a Japan privet, having dark, oval foliage and graceful habit. It has white fragrant flowers.

Lilacs.—Among these there have been a great many valuable additions that give this old-fashioned shrub a prominent place in the gardens of today.

Roses.

Marchioness of Londonderry.—This is a new ivory white hybrid-perpetual; the flowers of very great size, carried on

stout stems. It is free flowering, highly perfumed, and one of the finest of the roses.

Mrs. R. G. Sharman Crawford.—This is deep rosy-pink in color, with outer petals shaded with pale flesh. It is a free bloomer all the summer.

This variety and the preceding one were awarded gold medals by the National Rose Society of England.

Margaret Dickson.—This is a magnificent rose—white, with pale flesh centre, and very fragrant.

Clio.—The flowers of this variety are large, of fine form, flesh color, shaded in centre with rosy pink. It has handsome foliage and is a vigorous grower.

Mad. Georges Bruant.—This has single white flowers with very pointed buds. The foliage of the new growth is very bright and contrasts prettily with the older growth. It is a free bloomer and well adapted for planting with Rugosa varieties, with which it is closely allied.

Liberty.—This is a hybrid tea-rose and is to be put on the market in the spring of 1900.

Its originator claims for it all the desirable qualities that a rose should possess, and whenever it has been exhibited it has attracted marked attention. Its color is like Meteor at its best.

Ramblers.—Among other varieties of roses the Ramblers deserve special mention, and among them the Crimson rambler is the most desirable. It is of climbing habit and can be grown in a variety of ways. It is of Japanese origin and is universally admitted to be the greatest rose novelty of recent years. It is perfectly hardy.

Wichuriana Hybrids.—This rose and its hybrids are valuable additions with their single and double flowers and rich glossy foliage. For a ground carpet or for trailing to any object, they are very desirable.

Lord Penzance's Sweet Briar Hybrids.—The foliage of these is deliciously scented, and the flowers are single and of the most beautiful kinds.

Herbaceous Perennials.

Campanula, Pericifolia Alba.—These have beautiful white bell-shaped flowers. They are useful for garden or pot culture as decorative plants.

Anemone, Lady Ardilaun.—A very robust form of Japonica Alba, having massive foliage. It is a more vigorous plant.

Hollyhocks, Alleghany.—A new strain, claimed to be superior to old forms. The flowers are large, delicately fringed, and beautiful in color.

Gaillardia, Grandiflora Compacta.—This has very showy red and yellow flowers, single, and continuously in bloom. They are useful for cut flowers. It has a more compact growth than the old form.

Rudbeckia, Golden Glow.—As this has been so universally grown during the short time since it was introduced, we need to say no more than that it is a valuable addition to our hardy plants.

Tender Plants.

Begonia, Glorie de Lorraine.—This plant is probably the most valuable addition to house plants that has been introduced for many years. Its beautiful pink flowers almost hide the foliage and give it the appearance of a bouquet.

Begonia, Tuberous—Duke Zeppelin.—This tuberous rooted begonia is a variety that will stand the sunshine. It makes a very showy appearance with its dazzling scarlet flowers.

Acalypha Sanderii.—This is a plant having such peculiar tassel-like flowers that it has been called the chenille plant. It well describes the flowers.

Adiantum Lathomi.—This plant is similar in appearance to the valuable Farleyense, but is of easier culture, and well adapted for house use.

Asparagus Sprengeri.—This is a vigorous grower and very useful as a green for arranging with cut flowers.

Carnation. Mrs. Thomas Lawson.—This has a very large flower of a bright carmine pink. The fabulous price paid for

this new variety attracted more public notice through the press than the advent of any other variety yet produced.

With these additions to our long list of valuable plants we need not lack variety.

Further remarks were made by David Fiske of Grafton, George McWilliams of Whitinsville, H. B. Watts of Leicester, Herbert R. Kinney, Henry Reed and Secretary Hixon of Worcester.

12th January, A. D. 1899.

ESSAY

BY

AARON LOW, Hingham.

Theme:—Vegetables.

Mr. President:—When your Secretary wrote to me that your Society wished me to give you a paper upon Vegetables, I thought that he had selected a very comprehensive subject; a subject that to the market gardener is of great importance, for at the present time if he desires to be in the front rank, he must ever be on the alert to cater to the whims and fancies of his customers in supplying them with such varieties of vegetables as they wish for.

The market gardener of forty or fifty years ago had a very simple task, to supply the demands of customers, as the number of varieties in cultivation were but few, and these mostly of the old standbys. Since that time, there has been developed and brought into general use many new vegetables then unknown.

Among the vegetables used or grown fifty years ago, Rhubarb was but little known. Now it is one of our best paying early spring crops, of easy and simple cultivation, producing as it will quite a number of tons yearly per acre, when well established and on early land; selling at good prices. The Giant and Victoria are both good varieties, having large, stout stalks, and are both rapid growers.

Asparagus is another vegetable, the demand for which has rapidly increased during the last twenty-five or thirty years. As one of our early spring crops, this must be reckoned as among the most profitable. When well established, it can be cropped for many years, giving good returns, as the demand is usually

equal to the supply. This crop can be well grown by the annual application of chemical manures. A good fertilizer would be 500 lbs. Fine Ground Bone, 300 lbs. Muriate of Potash, and 200 lbs. Nitrate of Soda.

Lettuce has largely increased in consumption, and as grown under glass is a very important crop. Large amounts are yearly sent from Boston and vicinity to New York markets, and has usually paid a good profit.

For a few years past, the out-of-doors lettuce grown in Florida has been an important factor in lowering prices of lettuce grown under glass at the North.

White Seed Tennis Ball, Big Boston, and New York are all excellent varieties.

The market gardener who can have a few acres of early Cabbages ready for market ahead of his neighbors, usually finds it to be a very paying operation, as the land can be utilized for a second crop of Celery or Squashes, and the cost of production of the second crop materially lessened.

The best early varieties are Early Spring, Early Peerless, All Head, and Succession.

For a few years past, there has appeared in New York, Philadelphia and Chicago markets in the spring of the year, a variety of cabbage imported from Europe which brings a much higher price than any variety of cabbage offered of American growth.

This variety forms a good sized, very solid head, and is a much better keeper than any of our native varieties. This cabbage is sold under a number of different names: Danish Ball Head, Hollander, and Solid Emperor. On testing the above varieties, I found them all of apparently the same kind. Without doubt it is one of the best kinds for the main crop. A barrel of this cabbage will weigh a third more than the best of our American kinds.

Since the War of the Rebellion, there has developed in the southern section of our country, an industry of great importance in growing vegetables to send to the Northern markets in the winter season, so now fresh vegetables can be had on our tables almost every day in the year. Previous to the War there was

but little competition between southern and northern grown vegetables, but since then, it has had a very important bearing on the market gardening of the North, lessening the demand, and also lowering the prices previously obtained.

Green Peas and String Beans are shipped North in large quantities during the winter months, and when the home grown supply comes in the demand has become small.

The same conditions apply to most varieties of vegetables, as the extent of our country is so large, that while the northern section is covered with snow, and under the grip of the Frost King, the southern section is producing the luscious strawberry and other seasonable fruits and vegetables. Although grown thousands of miles away, the improved methods of transportation deliver them at our doors, apparently as fresh as when picked from our own vines, or gathered from our own gardens. The above condition of things the market gardener of the North is obliged to confront, and one of the most important problems of the future is its successful solution.

Another important factor within a few years has entered into the production of vegetables,—the canning industry. Thousands of acres are annually grown solely to supply the canning factories. Perhaps the two most important vegetables grown for that purpose are the Tomato and Sweet Corn. Many of those present doubtless remember the first appearance of the Tomato in our markets. Some forty-five or fifty years ago a neighbor came to me one spring morning and wanted to know if I would not send with him to Boston and buy a dozen of tomato plants. He said he did not want more than a half-dozen and thought I might want the rest. We sent and got them, and I think they were about the first tomato plants set out in the town.

There was not any demand in the market for Tomatoes, but an increasing demand to try them. The following spring I commenced growing the plants in hotbeds. The demand rapidly increased, and in a few years I had to grow many thousands of plants to supply the call for them. The demand for Tomatoes in the open market rapidly increased, the first brought in selling

from $6.00 to $8.00 a bushel, and seldom going below $1.00 for the later or main crop.

No vegetable has been more rapidly improved than the Tomato. On its first appearance the fruit was rough and ill-shaped, so that a large part had to be thrown away in preparing it for the table. The rapid increase in the demand for Tomatoes was without precedent. It sprang at once into universal consumption. New and improved varieties were introduced, larger in size, smoother in shape, and earlier in ripening. Its cultivation rapidly extended over the entire country, and at the present time, in the southern part, it is considered as one of the most important crops grown.

Varieties have mutiplied almost indefinitely; and among such a large number of different kinds, many of which are of great excellence, it is not difficult to select a half-dozen adapted to all sections and markets.

Some markets give the preference to the pink tomatoes, others to the bright red varieties. If I was to select, judging from my own experience, varieties the best adapted for market and home use, I should name the following kinds: Early Comrade, New Imperial, Perfection, Essex Hybrid, Dwarf Aristocrat, Dwarf Champion, May's Favorite, and New Stone.

Second in importance to the Tomato, especially to the canning industry, is Sweet Corn. Not only has the demand in the market largely increased, but thousands of acres are annually grown to supply the canning factories, and if desired, sweet corn can be had, of first quality in sweetness and flavor, for table use, the entire year. Many varieties are in cultivation, but for all practical purposes, a few kinds still stand at the head of the list. As a variety for both purposes, canning and table use in its green state, Early Crosby ranks the highest. This has a good sized ear, kernel very sweet and tender, and although not growing a large stalk, is productive in the essential point of good ears.

As a later variety, Potter's Excelsior ranks high, both in quality and productiveness. As a still later variety, with larger ears and kernels of luscious sweetness, Stowell's Evergreen fills the bill. There are many other kinds of marked excellence, but

for a succession from first to last, the three named will give perfect satisfaction.

Judging the importance of any vegetable in its value as an article of food to the world, we must accord to that grand old vegetable, the Potato, a very high place. For is it not speaking within bounds to say, that hardly a day passes but it is in use upon the tables of the rich and poor alike?

I do not believe that there is any other vegetable so universally grown by every farmer in the land, or which holds a higher average in his crops, than the potato.

The farmers of fifty years ago had but few varieties in cultivation. The old Long Red, Orange Yellow, Jackson White, and Blue Nose, were the principal kinds then known.

On the advent of the Early Rose Potato a new impetus was given this vegetable. The unparalleled success of this new variety, combining as it did earliness, great productiveness and first-class quality, placed it at once at the head of all known varieties.

The great advance of this variety infused into the hearts of all seedsmen an earnest desire to bring out other new kinds, which should if possible surpass the merits of this wonderful variety. Many new kinds were introduced, some of much merit, but the Early Rose still holds the prestige of being one of the very best in quality and productiveness.

Among the many valuable varieties introduced since the Early Rose, Beauty of Steben, New Queen, Early Essex, Clark's No. 1, Carman No. 1, and Carman No. 3, and Early Fortune are the most desirable. As indicating the great magnitude of potato growing in this country, I received a communication a few days since from a large Western seed firm, stating that they sold the past year 87,500 bushels of potatoes for seed purposes.

In some sections of the country Squashes are largely grown, especially in the vicinity of large canning establishments, as the squash ranks in the amount of product put up as one of the largest. Quite an important point in growing squashes in our section is to utilize the land used for early cabbages, peas, and early potatoes, in growing this as a second crop, planting them

at the last hoeing or by the middle of June. As large a crop can often be grown by this method as if no other crop had preceded it.

When I first introduced the Essex Hybrid Squash, a friend came twenty miles to get seed enough to plant an acre, then planted to early potatoes. He grew upon that acre 400 bushels of potatoes, and as a second crop nine tons of Hybrid Squashes, and received first premium on both crops from the Essex County Agricultural Society.

The only labor performed on the squash was sticking these seeds into the side of the rows ten feet apart, and hoeing them once when he dug the potatoes. Another market gardener of Dedham, after taking off a crop of Early Turnip Beets from one-half an acre, planted it to Hybrid Squashes the last of June, and informed me in the fall that he grew eight tons on the half acre, and that almost the entire lot were handsome, good sized, marketable squashes.

In thus growing two crops the same season, of course the land must be well manured and in good condition, and it is well to use for the second crop some active nitrogenous fertilizer to give the plants a rapid growth, as upon a strong, vigorous growth at first depends your success.

Perhaps the Essex Hybrid is the best variety to plant for the second crop, as it is of rapid growth and quick maturity.

Of the many kinds of squashes now in cultivation, the Boston Marrow, Dunlap's Prolific Marrow, Bay State, Essex Hybrid, Warren, and Hubbard are the most desirable.

In the vicinity of the large cities, growing of the melon crop is often very profitable by starting the plants under glass or in hotbeds and transplanting them to the open ground the first week in June. Those who have warm, early land will often find the melon crop giving as large a profit as any. Melons can be planted in the open ground from the 25th of May until the 10th of June, and, if a favorable season, will give good returns for your labor. A few years since I planted half an acre on the 8th of June, following a crop of spinach. The amount grown on the half-acre was 200 boxes of very nice melons, and were

sold at an average price of $1.25 a box. The varieties grown were Orange Christiana, yellow flesh, and Extra Early Hackensack, green flesh,—two excellent kinds.

Within a few years there has appeared a number of new melons, which seem to be superseding the old well-known kinds in many of the large markets. Prominent among these new varieties I will name the Colorado Gem, Paul Rose, Rocksport, and last, "Nectar of Angels." The last named certainly ought to be the best of all, and I shall try it the coming season.

The Colorado Gem wherever known has been in great demand, as although small in size in quality it ranks the highest. Of the older varieties, Montreal Nutmeg, Extra Early Hackensack, and Arlington, of the green flesh, and Orange Christiana, Tip Top, Millar's Cream and Emerald Gem, of the yellow flesh, are all choice, and will give satisfaction to all.

Celery is another vegetable that has largely increased in cultivation within the last twenty years. Where formerly it was grown in small acreage, it has now become an important crop to many market gardeners living near large cities. A market gardener living near Boston had sixty acres in celery the past year, and a number of others from twenty to thirty acres.

Many large gardeners who have land adapted to growing onions, when sowing the onions, omit every sixth row, and later set that out with celery plants. The onions maturing by September are taken off, and the remainder of the season the land is devoted to celery. The old varieties of celery had to be banked up when growing to properly blanch the stalks, to render them fit for table use. A few years ago a variety was introduced from Europe named Golden Self Blanching, which proving very desirable as not requiring the extra labor of banking has largely superseded the old varieties in cultivation.

The onion upon land adapted to its growth, and when sufficient help could be obtained to perform the cultivation necessary, was formerly a very paying crop. Now the sharp competition of onions grown on the fertile lands of the West, with which our markets are overstocked, renders this crop one with but a small margin for profit. This crop is one which

requires a large outlay for sufficient fertilization to carry the crop to maturity, and which has to have as large a cost for labor in weeding, harvesting, and preparing for market. It can only be grown where plenty of cheap labor can be had just at the time when it is needed. This crop is not as universally grown as most of those I have called your attention to.

Mr. President:—

There are various other vegetables which I should be pleased to notice if time permitted, but as I have briefly brought to your attention most of the prominent ones in general cultivation, and believing as I do that the principal object of the papers read at our Farmers' Clubs and Institute meetings should be to call out the ideas and practice of those present, I trust that all will freely criticise any point brought out, giving their own ideas and practice in relation thereto; by so doing, our meeting can be profitable and instructive to every one present.

19th January, A. D. 1899.

ESSAY

BY

JOHN FARQUHAR.

Theme:—Our New Possessions—Hawaii.

Illustrated by Stereopticon.

The most momentous question before our administration, at present, is the annexation of certain sections of the globe that have recently come under our control. I am not a politician in the popular sense of the word, although I never hesitate to vote as my conscience dictates. I have been invited to address you regarding the most momentous of these recent annexations—the Hawaiian Islands. There can be no question but what this is a valuable annexation, being so near our western coast. They are the nearest land from Portland and Seattle, and afford excellent protection to our western coast against rival powers. It is five days' sail from San Francisco, Seattle and Portland. Aside from the situation, I want to show you, ladies and gentlemen, that we have in these Hawaiian Islands valuable territory. I would say here that when I come to a Horticultural Society I mean to speak only on horticulture, but, on the present occasion of speaking before this Society, I thought it might be gratifying to say something aside from horticultural interests. I shall endeavor in this address to omit nothing which might be of horticultural interest.

The voyage to Honolulu occupies nine days, really ten, but in going west as you cross the one hundred and eightieth meridian you live one day over twice, and coming east you drop one day. I took passage on the Oriental Steamship line,

which I found much inferior in speed and accommodations to the Canadian and Pacific line. The smooth seas and warm temperature made a pleasant voyage. The average temperature of this section of the world is 82 degrees. One very pleasant feature of the voyage is the swimming tank. It is a very large bag into which is pumped 25 gallons of sea water.

We see to the north of us Bird Island. Thousands of birds make their home in this island. There lies to the north the island of Lasage. These are now under our flag. They produce large quantities of guano, and ship it to Honolulu, and it also has a large trade in eggs. There are over twelve small islands of like character attached to the western group, and the only business carried on is the gathering of guano.

The most important island of the Archipelago is Oahu, on which Honolulu is situated. This island is 300 miles in length and 600 miles in breadth. Its population is 40,000, of which 30,000 reside in Honolulu. The next in importance is Hawaii, with an area of 4200 square miles and a population of 43,000. Kauaii is third with an area of 760 square miles and a population of 10,000. Hawaii holds preëminence and is the seat of government.

The harbor of Honolulu is the finest in the group, and owes its existence to the coral reef. It is the only harbor on these islands to which a steamer can make fast to a dock. Immediately upon a steamer's arrival it is met by a crowd of boys, who invite the passengers to throw coins and see them dive. When one is thrown they dive for it, and place it in their mouth, and call for more, until soon the cheeks of the lads bulge out with coins.

The Hawaii Islands boast of few hotels. I was directed to the Arlington and reached there about five o'clock in the afternoon, registered, and proceeded at once to the post-office. To my amazement I found that office closed at four o'clock. I had nothing to do but wait until the next morning. I was very anxious for mail, having been without it for four weeks. Eight o'clock had hardly struck before I was standing at the post-office; five minutes past and still it remained unopened; then,

fifteen minutes elapsed and still the crowd increased; twenty-five minutes past, and there must have been at least 150 persons waiting. At twenty-eight minutes past the door opened, and one clerk proceeded to give out the mail. I got mine at 9.45. From this you can get some idea of the management of the office. I had some photographs to send away. I inquired at the stamp window for the proper postage, and was told that it would be two cents. I gave the two cents in payment, and the clerk said, "We do not take coppers, nothing less than five cents."

Next I proceeded to ascend Punch Bowl, along a good carriage road to this long extinct crater. This view shows the inside of the crater. The carriage road leads around the mountain, from which one gets a view of the harbor. It is divided from the ocean beyond by the extensive coral reef. To the east of Punch Bowl are two beautiful valleys, in both of which are many beautiful residences. This valley is really the crater of an extinct volcano. Along this valley are palms and Night Blooming Cereus.

This is the home of Sandford Doane, who held a government position for five years, and was instrumental in bringing about the annexation of Hawaii. The residence of the ex-queen has been here since 1893. Near here are a company of United States troops, who are stationed in the rear of the palace. The raising of our flag over this building took place three weeks before I arrived. Among the crowd was great enthusiasm, and many were moved to tears. It is well known that the Japanese wanted to annex Hawaii, and it was only on account of negotiations with the United States that they were prevented from accomplishing their end.

The natives are well developed physically; are tall, broad-shouldered, kind-hearted and serious. They are very fond of horseback riding, ladies as well as gentlemen.

The population of this new territory is 117,000, divided as follows: Natives, 39,500; Japanese, 28,000; Chinese, 26,000; Portugese, 15,000; Americans, 2,500; British, 1,500; and the rest foreigners. There are 3,000 United States troops stationed

at Honolulu under a building at the market-place, which is simply a steel framework.

At the market-place are displayed all of the vegetables and fruits which could be found in this country. There are over seventy kinds of fish, from the shark to the shrimp. The mullet is the most appetizing. Some of the fish are very repulsive looking. The Chinese preside over the vegetable stores. Here are found turnips, potatoes, carrots, parsnips and strawberries. These grow on elevations of three or four hundred feet. Women as well as men sell in the market-places. One woman was sitting outside of a building opposite her store. Hardly had I taken this picture before she darted across the street, and proceeded to cut deftly a section of meat for a waiting customer.

Flowers grow abundantly, and the natives are passionately fond of them. The flowers are not made into bouquets but in long wreaths, and are worn around the neck or over the shoulders. It is customary to present to a friend going on a journey two of these wreaths. When the steamer leaves the dock he throws one to his friends on shore and keeps the other as a souvenir.

This shows a picture of a steamer on which we are to go to San Francisco.

We have here a wall made of coral rock.

This is one of the principal streets, bordered on either side by Royal palms.

Taking one of the cars on the street which we have just looked at we ride out on King street, where we see some of the troops fishing under large trees. They asked me to take their pictures to send home to their friends. This street is approached by rows of Date Palms, which lead through a grove of Cocoanut trees and Giant Fern trees. These are exceedingly beautiful. These fern trees almost conceal the residence of the Prince.

I was invited to a native feast. The distinctive feature of this feast is roasting of pigs. The pigs are roasted over hot sticks. They are small, some being only two months old. It

is a favorite dish of the native Hawaiian. This dish was accompanied by various vegetables.

We have here the native grass house. Attached to this house was Camp Otis where 3000 of our troops were stationed. The major was making a tour of inspection, and invited me to accompany him. This shows another section of the field, in which the men are drilling. I saw a number of New York troops stationed at this stand who were anxious to have me take their pictures to send home to their friends. Here we have some New York troops sitting under trees eating their mess, which was hardly suited to the country. The government did not provide fruit and vegetables, although the country afforded plenty of both. The hospital was crowded with soldiers who, as a result of the food, in such a climate, had become sick. Most of the troops came on the *Arizona*, and were intended for Manilla, but were left over. The natives arranged a dance for the entertainment of the officers of the *Arizona*. I was invited to be present, going in a party with the correspondent of the *San Francisco Call*. The natives are fond of singing and dancing. They took two calabashes, and by clashing them together, produced a hollow sound which accompanied their dancing. The natives at once appeared with lays of flowers and some of them in native dress.

This is one of the streets which is lined with beautiful residences, and bordered with Century plants. Here we have another of these residences showing palms and also fine groups of beautiful ferns about the house growing luxuriantly. This also shows palms and ferns which one finds in going up this valley, and in suburbs of Honolulu palms are grown extensively.

This picture shows a native picnic. A party of ladies making lays of these native flowers to carry home to their friends are sitting under a Hybiscus tree.

This gives an idea of the rich vegetation of the valley. Here are beautiful tree ferns and Hybiscus, which looks like Mangrove. The flower is yellow with a white centre. The valley terminates twelve hundred feet above Honolulu in a precipice nearly one thousand feet steep. This is a view of the valley,

which is six miles from Honolulu. It was the only possible course to Honolulu in that vicinity until the road was cut. The termination of the drive along this way was cut out of a precipice. This road has been cut at great expense. This place is of great interest because of its history. At this place the King of Hawaii murdered two English captains.

This shows the cultivation of rice by the Japanese and Chinese. You can see such a picture as this at any season of the year in the department of rice culture. The soil is extensively rich, and the Chinese are excellent market-gardeners. This picture shows a field of beans. The Chinese get immense crops from them. We now see a field of lotus, extensively grown in Japan and China. It is valuable for its roots which, as an article of food, is much relished by the Eastern people, being sometimes preferred to olives.

Here we see the beautiful residence of S. M. Damond, who managed the finances of the Queen, which she presented him in recognition of his services. Proceeding along the avenue lined with date palms we come to a grass house which formerly was used by the better class of Hawaiian people. We found in this house a great many antiquities, and some idols that were worshiped by the natives.

We saw quantities of the better class of bananas. They are no such bananas as we get in Worcester or Boston. This class of bananas sell readily at forty cents, but when better varieties are introduced there is no reason why they should not bring a fair price. There are a good many things that might be introduced into these islands successfully, and there is no reason why chocolate cannot be grown here. Tea and coffee are next to sugar as a staple industry. Numerous fields of pineapple are grown for both home and foreign use. The first crop was absorbed in a Honolulu market at seventy-five cents apiece. These are much superior to the pineapples previously grown there, and are now exported in large quantities to San Francisco. Oranges, lemons, and all citrous fruits grow well in Hawaii. Last year they imported five thousand dollars worth of these fruits from San Francisco.

This shows a picture of a date palm in fruit. There are huge bunches of fruit at the top. The tree was fifty feet in height. These trees grow remarkably quick and give excellent results. It is a fruit that is now grown to some extent, but they do not have the best varieties. The Liche, ordinarily found along rivers in China, especially in Canton, grows extensively. You sometimes get the fruits at Chinese stores, but here it is usually inferior on account of age. It tastes like delicious raisins when fresh, but the Chinese rather like it when it is musty.

This picture shows bread fruit, which grows in great abundance, tastes very much like bread. It is extensively used in our tropical countries. The leaves of the plant are used to wrap meat in, and it has the effect of rendering meat tender that is tough.

I met a number of troops who had walked from Camp Otis a great distance, and were expected to walk back. They complained bitterly of the food they received, but it was not the fault of the government, but through the mistake of some official, the supplies failed to reach them. I have since learned, through a letter from one of the young men, that conditions have been improved.

This is an interesting group of natives who are washing clothes in the brook. Growing along the banks of the river is a beautiful purplish flower.

This is the picture of a beach, along which some of the Exqueen's fishermen are enjoying themselves, while here we see the residence of the late Robert Louis Stevenson. Many beautiful plants surround the house, including nearly all of those found in our greenhouses. Vines cover the veranda and arbors. Near the house was a large tree which stood sixty feet, and which was planted twenty years ago.

This is a beautiful yellow oleander tree which is grown extensively in China. We find here two crotons, cultivated in the Hawaiian Islands more extensively than in any other place, except Jamaica. The natives make use of the crotons. The Philanthus is found here. It has purplish leaves. It makes

an excellent hedge plant. On the higher mountains is found Sandal Wood. The Yucaliptus is found in one hundred and fifty different varieties in cultivation in different sections of the island.

This is a scene at the railroad station of Kauai. There is now a railroad running around the coast for a distance of one hundred and fifty miles. It is interesting to see the different nationalities represented at this place. I had a chance to witness a boat-race, and I never saw more enthusiasm displayed at a Harvard-Yale game than was displayed at this race.

Here is a sugar plantation which is the most productive in the world, yielding a dividend of sixty per cent. It yields millions of dollars worth of sugar yearly, and employs twenty-four thousand people, three-fifths of whom are Japanese. The product of sugar is nearly three times that of the West Indies. Passing along we come to a stretch of unproductive land, which might be made highly productive by irrigation.

We have here a picture which shows what is known as the Barking Sands. The sand along this beach is blown upon the rails, and when the train passes along produces a sound like a dog and is therefore called the Barking Sands.

This shows the Tycena Lutea, which is used to wrap up fish. The leaves impart a delicate flavor, and render the meat and fish more tender. No native ever cooks anything of this kind without using this leaf.

On the island of Molokai is the home of lepers. Leprosy is not indigenous to the island, but was introduced a few years ago; also mosquitoes were introduced from South America. This settlement covers a thousand acres.

Here is a view of Cocoanut Island near the harbor. It shows the house where the municipal government was carried on. Kilo has been held back in its progress by Honolulu. The government did not give them money, but for all that it is destined to become the capital, as it is better situated, being two hundred miles nearer San Francisco, and its harbor is easily approached.

This is a view of some magnificent Oleanders, and more inter-

esting palms. This view shows one of the flues in which sugar cane is floated down from the plantations. This gives you an idea of the streets of Kilo. A drive of thirty miles from Kilo brings one to the volcano of Kilauea. Along the road is the most wonderful vegetation, including Dixsonias, Brazilian Tree Ferns and Begonias.

Col. Sacket, from the west of London, has recently bought a coffee plantation here. Coffee at present is sold for sixteen cents a pound, and would pay very well at half that price. At the end of three years a tree will yield three or four pounds of coffee. There is an enormous rainfall, but the rain is at once absorbed because of the dryness of the earth. Coffee is never grown below a height of fifteen hundred feet, and sugar is never grown above this height.

This shows a vine which infests the trees, and finally kills them, and is only limited in growth by the height of the tree.

Above three hundred feet peaches, carrots, parsnips and pears can be grown.

This view shows a volcano mine which overlooks one of the most wonderful craters in the world.

The temperature here never goes above ninety degrees, and below fifty degrees, but on the mountains there is found snow and ice. The temperature is influenced by the Japan current.

This is a section of the surface of a crater. It is three miles long and eighty-two and a half miles wide. There has not been an eruption for eight years. It is only active towards the centre. The lava is very beautiful, being blue, gray, purple and crimson. Vegetation starts up quickly over the lava. This shows a picture of lilies which are very common here. They can be grown at any time in the year, January, April, July, or October.

There is no question but that the possession of these islands would be of great value to this country. The Japanese were very anxious to get possession of Hawaii. Opinions may differ regarding the Phillipine Islands, but we have nothing to regret so far as the annexation of the Hawaiian Islands are concerned.

26th January, A. D. 1899.

ESSAY

BY

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Theme:—Trees, Flowers and Fruits of the East.

As the traveller approaches the golden city of the East,—that city perched on its seven hills and spanning two continents,—two species of trees come prominently into view: the one the symbol of life and perpetuity, the other of death and extinction; the one planted when a male child is born, the other marking the last resting-place of some beloved one; the one a giant in size, shading with its outstretched limbs and broad leaves a great area of ground, the other an evergreen, close and compact, tapering up to a point; the one, the *Platanus orientalis*, the plane or sycamore, and the other the *Cupressus horizontalis* and the sempervirens found in every Turkish cemetery. A greater contrast between two trees cannot be found. The one standing alone or in small groups, the other massed in such numbers as to constitute a forest, miles in extent. Of the former, two specimens arouse the attention of the curious sight-seer. One stands in the courtyard of the Seraglio at Constantinople, more than fifty feet in circumference and reputed to have been planted by Mahomet II. in 1452, to commemorate the birth of his son. In one of the great ravines dividing the hills of the Bosphorus on the European side, in the valley of Buyukdéré, about fifteen miles from the city, stands the other, celebrated alike for its age, its size and the historic memories that cluster about its weather-beaten trunk. For two thousand years,

according to the calculations of the botanist de Candolle, has it looked down on the generations of men that have lived and died and passed away. It is about forty-seven yards in circumference at its base, while its branches afford shade to a circular area of one hundred and forty yards. Its huge stem, called the seven brothers, is divided into a number of branches, seven of which issue from below the present surface of the soil, while seven do not divide till they rise a few feet above. The interior of one of these divisions of the main trunk has been hollowed out by fire and fashioned into a coffee-shop in which fourteen or fifteen persons can be easily accommodated. "It is," says an enthusiastic Frenchman, "a temple of verdure whose leafy dome rests amid the clouds." And here nine hundred years ago, in this great temple of nature, while the choirs of birds sang matin masses in response, tradition tells us that Godfrey de Bouillon gathered together his crusading host and offered up a solemn thanksgiving to the God that had brought them thus far upon their way. And we may well believe that as the warlike bishop, Adelhemar of Puy, elevated the host and blessed the kneeling multitude, the cry once more arose and swept from rank to rank, till with one loud shout the whole vast army, six hundred thousand strong, joined in "Dieu le volt! God wills it! God wills it!"

The cypress is only found in Turkish cemeteries, being planted perhaps for two reasons: because its aromatic resin helps overcome the effluvia arising from the shallow graves; and because its evergreen foliage, dark and sombre though it is, is the emblem of immortality. The Greeks and Armenians, instead of the cypress, use the sycamore or, quite as frequently, the graceful *Pistacia terebinthus* or turpentine. These grow to considerable size; one in the garden of the British Embassy measuring twelve feet in circumference, being over a hundred feet high and shading a circle of one hundred and eight yards. These trees, notwithstanding their size, are sometimes parasitic, and but a few years ago, just across the Bosphorus, on the Asiatic side, could be seen an enormous one growing out of a still larger cypress. There is another peculiarity of the tree.

A species of insect, probably an aphis, forms a nest in the extremity of the leaves by puncturing its substance, which then becomes fungous and swells into fleshy follicles of a bright scarlet hue, having a strong resinous odor and clammy feel and full of turpentine. They are so abundant sometimes as to give the tree the appearance of bearing rich flowers or fruit.

Another variety of this tree, the *Pistacia lentiscus*, yields that pure, transparent gum, the Mastic, used by the natives for chewing purposes, to preserve the teeth and sweeten the breath. It is also used by the Greeks to improve their brandy made from grapeskins. It is procured by making incisions in the bark of the tree, the resin exuding in clear, tear-shaped drops. So highly was the product of the island of Scio esteemed that the inhabitants were compelled to pay an annual tribute of one thousand pounds for use in the Sultan's seraglio.

The olive is grown over a very wide area, especially in Asiatic Turkey and the Mediterranean islands. An olive orchard in the flowering time is one of the most beautiful sights in the world,—the gnarled and twisted trunks, hoar with age; the short, oblate, slightly curled silvery leaves; the branches fairly bending beneath the weight of the snowy petals; and the ground beneath and around white as with flakes of snow. Job says, referring to this peculiarity of its shedding its blossoms, "He shall cast off his flowers as the olive." Next to the cereals, it is by far the most important agricultural product of Turkey. Its berry, pickled, forms the chief article of food; the oil, produced from its pericarp, seasons most of the dishes, and keeps alive the light that cheers the winter's gloom; its wood, close-grained and hard, takes on a beautiful polish and is very highly prized; while its bark and leaves, possessing certain febrifuge principles, are much sought after by the leeches of the country. The tree is slow in reaching maturity, but after the fifteenth or sixteenth year it bears on indefinitely, and seems never to lose its vitality. There are trees in the garden of Gethsemane estimated to be over a thousand years old, still in full sap and vigor. It is of all fruit trees the hardiest, for scarcely any amount of mutilation, any severity of frost, or

even sharp scorching by fire suffices to destroy its life. "So long as there is a fragment remaining, though externally the tree looks as dry as a post, yet does it continue to bear its load of oily berries, and for twenty generations the owner gathers fruit from the faithful old patriarch. This tree also requires but little labor or care of any kind, and, if long neglected, will revive again when the ground is dug or ploughed, and yield as before. Vineyards forsaken die out almost immediately, and mulberry orchards neglected run rapidly to ruin; but not so the olive. Though they may not have been attended to for half a century, yet they continue to be a source of income to their owners."

These peculiarities Virgil observed and carefully noted in his Georgics nearly two thousand years ago:—

> "But on the other hand, no culture needs
> The olive tree at all; not it the knife
> Fortheurved expects, nor clinging hoe, when once
> It in the field is fixed, and bears the breeze.
> To it the earth, its bosom loosened up
> By furrows of the ploughshare's hook-like tooth,
> Sufficient moisture gives, and gives the plough
> Returns of weighty fruitage rich and ripe."
> —Georgic, II., p. 420.

> "Why, cleave an olive tree's dry stump, and, strange
> And wondrous strange to tell, an olive root
> Will from the dry wood come!"

Frequently a whole village will unite and plant a grove in common. Then not even the berries that fall to the ground are allowed to be picked, till a proclamation is issued by the head man of the village or the governor of the province. A tree yields from ten to fifteen gallons of oil, and the profits are about one hundred dollars to the acre. It is claimed that the tree bears only every other year; but this is due probably to the vicious manner of gathering the fruit,—beating the branches with long poles to shake off the berries, and, in so doing, bruising and destroying the tender buds that are setting for the next year's crop.

The husks with which the prodigal son would fain have filled

his belly, and which Scripture says the swine did eat, were not after all such very poor fare. Many a repentant sinner might go farther and fare worse. They are the fleshy pods of the locust tree (*Ceratonia siliquas*), a leathery brown when fit to eat, some six to eight inches in length, containing a spongy, mealy pulp, of a sweet and pleasant taste in its ripened state, and in which are imbedded a number of shining, brown seeds, very hard, and somewhat resembling a split pea. These seeds are of no value whatsoever, on account of their bitter flavor; but the sweet pulp of the pod, when dry, is extensively used as an article of food, particularly among the laboring classes. In Syria it is ground up into a coarse flour, and a species of molasses made, which is used in the preparation of different kinds of sweetmeats. As food for horses it is exported in large quantities into the south of Europe. Into this country and Great Britain it finds its way, under the name of locust beans or St. John's Bread, receiving both names from the ancient tradition that they are the "locusts" which formed the food of John the Baptist in the wilderness. The tree is cultivated extensively in all the countries bordering the shores of the Mediterranean, both for its food-producing qualities, and its wood, which is hard, and susceptible of a fine polish. In size and manner of growth it resembles an apple-tree, but is more bushy and thick-set. It yields a prolific harvest, and it is not unusual to see a tree bearing over half a ton of green pods.

One other tree deserves mention, not on account of its food-producing qualities, but for its importance in a commercial point of view. It is the shrub oak,—the *Quercus ægilops*,—which, growing wild on the mountain slopes and rugged steeps, where nothing else will grow, gives employment to hundreds of men, women and children, who, in the season, go out to gather the acorns. These are brought down in sacks to the nearest seaport, whence they are exported, thousands of tons annually, under the name of "valonia," to be used in the tanneries of Europe. They readily command eighty to ninety dollars a ton; and, from the seaport towns of Smyrna and the islands adjacent,

forty thousand tons have been sent to England alone in a single year.

The wild olive, *Elæagnus augustifolia*, grows abundantly in low situations and humid soils. It has more the habit and appearance of a willow than an olive, though the underside of the leaf is hoary and sometimes quite silvery. The fruit is dry, mealy and saccharine and retains for a long time its usual size and form. It is sold extensively in the markets.

The *Acacia julibrassin*, though not a native, is found in every garden in and around Constantinople. The foliage, though not sensitive to the touch, is highly susceptible to the variations of the atmosphere. On a bright day the dense pinnate foliage gives a thick shade, but if rain threatens, the leaflets close their under surfaces together and the tree seems denuded of leaves. The beautiful, large clusters of stamens of bright pink color and rich silky texture make it an essential favorite among the Turks who have given to it the poetic name of Gul Ibrisim or Silk Rose, and from this has arisen the specific botanical name of Julibrassin.

The *Smilax excelsa* runs riot in all the woods covering the hills on either side the Bosphorus. It climbs to the tops of the highest trees, and descending in streaming branches forms a lofty green wall by the roadside. In autumn, loaded with rich, red berries, it is wonderfully beautiful.

The cherry, a pale, amber-colored, transparent variety, grows wild in the woods of Asia Minor. The flavor is delicious. The peculiar fact about the trees is their great height, the lowest branch being thirty to forty feet from the ground and the whole tree measuring seventy to ninety feet.

Other fruits abounding are apricots, figs, walnuts, plums, medlars, chestnuts and filberts. The pears and apples are not worth mentioning. The fig-trees grow to very large size. The trunk of one standing in my father's garden was about the circumference of my body, and in its branches I used to sport in my boyhood's days. The apricot-trees were likewise large, the size of our largest apple-trees, the fruit more nearly the size of the peach and more juicy than those grown in this country.

Among the shrubs, one of the most beautiful is the Red Bud or Judas tree (the *Cercis siliquastrum*) which grows in profusion on every hillside. As you descend the Bosphorus in the early spring, the mountain slopes on either side from the water's edge to the very summit are ablaze with its bright pale red blossoms, while interspersed are the beautiful flowers of the almond. The buds are gathered and used with other raw vegetables by the natives in salads, to which they lend a charming color and flavor.

The *Rhamnus paliurus* or buckthorn is the common hedge in Asia Minor and forms a most impenetrable hedge. It is covered with spines which stand in pairs, one being straight and pointed and very sharp, the other hooked, so that once any portion of a person's dress is caught, the whole soon becomes engaged and it is very difficult to tear oneself loose. Like the "wait a bit thorns" of Africa, once caught, there is no hurry in getting away. It is popularly believed to be the plant from which our Saviour's crown of thorns was made. It differs very materially from the *Spina christi* in the membranous wing surrounding the seed-vessels. In fact these seed-vessels are its most marked characteristic, for when fully ripe, they hang in profuse clusters of a vivid light-green or yellow, giving the tree the appearance of being clothed with rich flowers.

The strawberry tree or arbutus belongs to the heath family or ericaceæ, to which belongs our common trailing arbutus. The species, I am inclined to think, is the *unedo*, but I am not certain. At any rate it is the one mentioned by Virgil in his Third Eclogue,—"Moisture is grateful to the sown corn; the arbute to weaned kids; the limber willow to the teeming cattle." It is a shrub eight to ten feet tall, with fruit fleshy, five celled, many seeded, dotted with little projections having the resemblance of a strawberry. The leaves are smooth and shining, oblong-lanceolate, more or less serrated. The flowers are white, growing in clusters, but each separate flower bearing a resemblance to a lily of the valley. The fruit of all the species seems to possess a narcotic influence, and wine is made in Cor-

sica from the arbutus unedo. The name strawberry tree in the United States has been applied to the *Euonynus americanus*, a very different plant of an entirely different order. I think it does not grow wild, at least I only recall seeing it cultivated in gardens.

The vitex agnus-castus, in company with the oleander, is found on the banks of all the rivers in Asia Minor. The pink and lilac blossoms form a beautiful combination in color, while their fragrance fills the air. The agnus-castus derived its name from being carried by the priestesses in the festivals held in honor of Ceres. To this day, certain virtues are ascribed to it.

Of the numerous flowers growing wild on the hillsides of the Bosphorus those coming most prominently to my remembrance are beautiful anemones, red, white, pink and yellow; three kinds of thistles, pink, purple and yellow; single hollyhocks of great diversity of color; forget-me-nots and English daisies; poppies flaunting their blood-red banners amid the pale lavender of the flax fields; white snowdrops and bloodroots pushing up their delicate flowers; the sign and symbol of the coming spring; while Scotch heather, wild thyme and lavender made the air redolent with their spicy fragrance. A species of erigeron or flea-bane, which is used (from its strong odor) to keep off noxious insects, light up with a ruddy glow the parched and withered vegetation of the islands of the Marmora in the fall. The *Pancratum maritimum* abounds in all the sandy plains of Asia Minor. It propagates by seed as well as bulb. It is claimed to be the lily of which our Saviour said, "And Solomon in all his glory was not arrayed like one of these." A gigantic arum grows on the plains of Broosa, the flower reaching the height of four feet, its spathe edged with purple and the stem variegated like tortoise shell. In a little valley lying at the foot of Mt. Olympus is one of the most fragrant spots in the world. It is planted entirely with roses of the centifolia, damascena and moschata varieties. For here is manufactured that most costly of essences, the attar of rose. As it takes the petals of 100,000 roses to yield 180 grains of attar, you can readily understand how many thousands were

planted in this garden. In mere sensuous pleasure, nothing can surpass this spot. You wander aimlessly about, lulled by the sweet notes of the nightingale, intoxicated by the fragrance rising from a myriad of flowers, the eye charmed by the wealth of color banked about you, and only wishing that each sense might be multiplied in power fourfold, that you might in a fourfold manner drink in the pleasure of the hour. The valley is appropriately called Gul Batistan, or the valley of gratification.

You pass from this valley of peace and repose, where everything conspires to lull the senses into a dreamy forgetfulness, into a place of wonderful commercial activity, into the great silk-manufacturing industry of the East. Broosa is one of the most beautiful and interesting cities of the Orient. It lies at the foot of the Mysian Mt. Olympus. The country around is volcanic in its origin and earthquakes are not unfrequent. Within my own remembrance it has been almost totally destroyed. In the centre of the city rises a rocky eminence crowned with the remains of an ancient citadel. To supply it with water, a long sloping passageway, descended by 150 to 200 steps, leads to the well or spring found at the bottom. It is pre-eminently a city of baths. Fuel is not needed, for hot springs abound, and by their side are fountains of ice-cold water fed by the melting snows of Mt. Olympus. Fronting the city are miles of plain covered with mulberry trees, mostly of the alba variety, for the leaves of the niger are not considered delicate enough to suit the delicate palate of the silkworm. It is a beautiful sight to see the tender care lavished upon these worms. They are tended by women who, twice or thrice a day, feed them with fresh leaves, brush out the droppings and remove the diseased or dead caterpillars. These women take the most scrupulous care of their persons and clothing in order to have nothing offensive about them. It is said that in sudden cold they will even cherish them in their own bosoms to prevent their being chilled. And this is not strange when you remember that the loss of their silkworms means the loss of their livelihood. The story of the introduction of this industry fifteen

hundred years ago is an interesting one. Silk was at that time brought from China and was worth its weight in gold, pound for pound. Some Christian monks who had been for many years resident in China came to the court of the Emperor Justinian claiming that the eggs of the silkworm might be imported safely. Commissioned by the emperor to undertake the enterprise, they departed on their long journey and returned after several years with the eggs concealed in a hollow cane. Meantime mulberry trees had been planted and soon the industry was started, which has lasted until the present day.

The implements of husbandry are very simple and primitive. The ox-yoke is made of two straight pieces, one above, the other below the neck, the top piece alone being hollowed. Two straight pins serve instead of the yoke to inclose the neck, a strong trunnel in the middle taking the place of staple and ring.

The plow is absurdly ridiculous. Take a pole about ten feet long, four or five inches diameter at the butt, and by mortise and tenon unite this at a slightly acute angle to another piece of about equal size, sharpened and shod with iron to plough the earth, and variously provided with some sort of handle for the plowman's hand, and you have an Oriental plow. It does not turn a furrow, it simply scratches the earth to the depth of four or five inches, and then the ground must be cross-ploughed in order to secure anything like an adequate preparation for the sowing. European plows, to which several pairs of buffaloes were attached, have been introduced at various times, but were soon given up on account of the difficulty of finding animals strong enough to draw them. The hope of success lies in the improvement of the breed, but there is something beyond this, for the best breeds introduced soon degenerate from lack of nourishment. The country must be better governed, property made more secure, before farmers will find it to their advantage to give their cattle more than the scanty grass they can pick up here and there on the parched hillsides. The improvement of implements will follow as a matter of course. The same thing is true of the ordinary horses; barley and straw alone, and the treatment received through many generations, has produced the

small, wiry, enduring hack of Asia Minor, as far removed from the lithe form and airy grace of the Arab steed as light is from darkness.

The spade is triangular in shape, with a straight handle, longer than a man is tall. A few inches above the blade, a piece of wood is mortised in, upon which the foot is set, to force the blade deep into the earth. The length of the handle enables the laborer to lay his whole weight upon the extremity, and afterwards use it as a lever in order to raise a large quantity of soil, which he merely turns over. "Shallow ploughing, but deep spading seem then to be two chief rules of Oriental agriculture."

The hoe has a broad blade, not flat, but slightly concave, the handle very short, compelling the laborer to crouch to his work. The sickle is about the same form as our own. The scythe, shorter, heavier, clumsier, the snath nearly straight, with but one handle, the left hand grasping the snath itself. The blade has no curve worth mentioning. Fortunately for the back of the laborer, hay is in so little demand that the scythe is practically only used in the cradle, and that, not by Turks, but almost exclusively by the Bulgarians. As you pass by the great wheat fields, you will see men and women with their sickles slowly and laboriously reaping the golden harvest. Ask them whether they could not do the work much more rapidly and easily with the cradle, and they will answer, "Doubtless." Ask them why they do not use it, and with a shrug of their shoulders they will reply, "Good Lord! it is not our custom." And *that* is the end of all controversy with an Oriental. To change the custom of his fathers is as impious an act as to defile the bones of his ancestors or curse his grandmother.

One is sometimes in despair of any progress in the Eastern world. The beginning must be made at the root. Educate the youth and they are as ready for improvement as any people. In some places on the rich banks of the Danube, modern implements of harvesting have been introduced, and the produce doubled, because the farmer is no longer afraid of sowing more than he can gather. The women do a great deal of work in the

fields, and may be seen laboring side by side with the men. The position occupied by them may be fairly well illustrated by the following story: A gentleman riding one day in the country overtook a man who had laden his wife with a heavy bundle of sticks. He remonstrated with him, saying, "My good man, it is too bad that you should load your wife down in this way. What she is carrying is a mule's burden." "Yes, your excellency," the man replied, "What you say is true. It *is* a mule's burden. But then you see Providence has not supplied us with mules, and he has supplied us with women." It is the same all through the East. Sir Thomas Munro, in his "Travels to the City of the Caliphs," relates as a reason why an Indian should be exempt from paying his tax that he pleaded the loss of his wife, who, "Did as much work as two bullocks."

Stuart Wood, in a recent number of the "Quarterly Journal of Economics," says: "The agricultural processes of different countries are among the surest indications of the condition of the laboring population. In Germany it is a common sight to see a cart drawn by a woman and a dog. Where labor is dearer and money more plenty, or the people a little easier, a horse releases both alike from their unnatural task. In the United States, where labor is dear, costly agricultural machinery is extensively used in spite of the smallness of the farms. It is much used in England also, because there the farms are large; and wages, although lower than in the United States, still far exceed those of other countries. In Russia, on the other hand, in Turkey and in Asiatic countries, we find the rudest tools; baskets are used instead of wheelbarrows, wooden plows instead of iron ones; and gangs of spade men replace both the plows and the beasts which draw them. A part of this is no doubt due to sheer stupidity, but much is also due to the price of labor and the rates of interest."

The products of the soil are as various as the climate and geological character of the country. Fruits are abundant, of excellent quality, and extensively used by the whole population. Grapes are delicious, and within reach of the poorest, selling at the rate of two and three-fourth pounds for two or three cents.

Apples, apricots, peaches, cherries and plums have their localities of abundant growth, but no attention is paid to obtaining the best kinds or improving those already possessed.

Of grapes, whoever has once partaken of the famous "chaoush" from the Byzantian side of the Bosphorus, will forever eschew all others: thin-skinned, small-seeded, fine-pulped,—a dream, a delight,—something to be talked about, *never* to find equalled. The vineyards of the Christians and the Moslems differ in one very important particular. The former cultivate those kinds suitable for making wines; the latter, those that are best for food. While the one are making spirits, the other are preparing that grape molasses called "pekmez," which is extensively used. In it, all manner of fruits are stewed or boiled, and the preserves laid aside for winter use. With it savory dishes of quinces and meat, or chestnuts and meat, are prepared, much relished by the poor.

The cereals of the empire do not differ much from ours. The exports are barley, maize and wheat. Rye, oats and millet give good results, and there are various other seeds of good native use. Looking only at the soil, climate, industrial population and the rivers and coasts of her great inland seas, Turkey ought to be our formidable rival in the markets of Europe, but her state of paralysis is such that nothing is to be apprehended from that quarter. Destructive treaties with England, and stupid legislation on the part of her own government, have reduced her to a state of hopeless bankruptcy.

Turkish agriculture and horticulture furnish all that the heart could wish in the shape of edible vegetables. All that we produce is there produced, with the exception of potatoes, which are imported from Europe;—squashes of various kinds and measure unlimited; okra, spinach, celery; melons unrivaled in flavor and size; cucumbers of any length you choose.

Among the vegetables, several deserve special mention. The tuberous knobs of the roots of the Cyperus esculentus are eaten either raw or made into some kind of a preserve. It is called by the natives heavenly manna or "manna turano," is quite sweet but somewhat woody in texture and looks like a minute potato.

Two varieties of egg-plant are grown, one similar to our own, and the other bearing a round, rich, dark purple fruit, called the apple of Sodom, because it is sometimes punctured by a minute insect, a species of cynips, which gangrenes the fruit and converts the inside into dry ashes while the outside preserves its plump and beautiful aspect.

The *Cicer arietinum* or chick pea, contrary to the other plants of the pea family, is distinguished by its serrated leaflets. The pea is of a bright yellow, half again the size of a large marrow-fat. It is cooked with rice or other dishes, or is simply parched and sold in the streets to be eaten as we do peanuts. When freshly parched it has a peculiarly crisp, pleasant flavor. It is claimed to be the parched pulse mentioned in Scripture.

A dozen or more different species of gourd are grown for cooking purposes, but I will only speak of the *Cucurbita claviformis*, which reaches a length of seven or eight feet. It grows so rapidly when well watered that in an incredibly short space of time it forms a dense, shady arbor, under which the people sit and smoke. When young, not more than six inches in length, it is boiled and then stuffed with force-meat and rice. This dish and meat-balls wrapped in tender grape leaves and covered with a white sauce are exceedingly palatable. Owing to its rapid growth it has been thought to be the gourd of Jonah.

In opening this lecture, I brought before you a picture of the most striking objects of nature as you approached the great city of the East, and now as I close let me leave with you the impression that lingers still with me after the lapse of forty-three years as I sailed away into the unknown West. Behind me lay the city of Constantinople, each minaret and dome blazing with light as though shot with purest gold. To the east rose the majestic, snow-capped peak of Mt. Olympus, its pure white crimsoned with the ruddy glow of the sun's last rays. From the mainland drifted over the spicy perfume of the heather and the thyme. The porpoises were gently sporting in the blue waters of the Marmora. As we steamed past the little islands

of Halki and Prinkipo, around huge bonfires the young men and maidens with hymn and dance were celebrating the summer solstice, leaping through the flames. A moment more and twilight deepened into night, and the scenes of my boyhood's days had faded away into a memory of the past.

2d February, A. D. 1899.

ESSAY

BY

EDITH BARNES, Northboro, Mass.

Theme:—Mosses and Lichens.

Ladies and Gentlemen of the Worcester Horticultural Society: When your Secretary wrote to me inquiring about subjects on which I could address you, I gave him, among others, this talk on Mosses and Lichens, saying it was of no practical value whatever, and would not interest a club whose attention was directed solely to those ends. Considered broadly, however, it has, in common with all studies whose immediate effect is to open the eyes, quicken the observation, give interest to nature, a very practical bearing, especially to people living in the country.

I think we will all admit that any condition which obliges a man to rearrange his plan of life, perhaps sell his home or move to other regions, possibly change his occupation entirely, is a practical consideration, as much so as finding out the best varieties of plum or how to destroy the latest insect pest. Yet, how often do we hear that one has left the farm or country home because the wife or children are not contented. Anything that makes a person happy or content in his enviroment is of the highest practical value. Now all the studies of nature,—landscape art, the birds, the flowers, these humbler plants,—if begun and persevered in, so that they become a part of one's spiritual nature, not a mere outside affectation, make one of the strongest bonds between the individual and the soil, man and a rural environment.

In days past, it has often seemed to me a fitting end to an out-of-door tramp to drop in upon one of our neighbors on my way home. There was something about her that was akin to sympathizing with the out-of-doors that made it a pleasing variation, yet an harmonious element, of my walk.

She was of old New England stock and traditions; a large woman, over eighty, nearly helpless with rheumatism, and nearly blind, so that her favorite seat was her arm-chair by her south window. Her face was as placid, fair and smooth as a girl's, and her brown hair as fresh above it. She had seen about as hard a life as any of us would care to face. Brought up on a farm, she had lived to see mother, brothers, sisters, all pass away; the farm lost and her father alone left to her, with nothing on which to live, except what they earned from day to day. Her father lived to be over eighty, supported, in part, by the town at the last. Then she came upon the town entirely for support, although allowed to care for herself in two rooms of the old house where they had lived for a number of years. Think of it! The last of all near relatives and friends, eighty years of unremitting toil, which had yet not sufficed to keep them from that which is so great a dread of all old-fashioned New Englanders, "coming upon the town." And yet this woman could say, "I have had a happy life!"

Now, I am not so much a special pleader that I am going to claim that this was all owing to love of nature: but I do think it was largely owing to their enjoyment of their environment (I say they, for both father and daughter were of much the same nature and disposition); an enjoyment which they got partly from people and partly from nature. Nature in the wild, and nature cultivated—their garden, the round of farm life in the neighborhood. Some of their knowledge was tradition: much, however, first hand, for they were good observers, especially the father. They found nature immensely interesting. There was a zest in their life and interest in things that I have not found in more favorably-placed people. There was superstition in some of their beliefs; to my more modern scientific way of looking at things, some unwarranted

deductions; but all were based on or related to acute, affectionate interrogation of natural phenomena.

As I entered the room, on my walk, she was all loaded and ready with questions. Hardly had I closed the door—I always let myself in—before I was seated, she was leaning forward with expectant attitude:—"Has your father planted his peas yet? He planted them the 17th of March last year. They ought to be planted in the full of the moon," she would add rather deprecatingly; for I think she knew that was a part of her creed I did not take much stock in—or, "Have you heard the piping frogs yet? You have? I used to hear them in the pond-hole here; but my hearing isn't as good as it used to be." Or, suiting the season, it might be, "Have the white oak trees dropped their leaves yet? Father used to say that when the white oak trees dropped their leaves, in the wood, the back of winter was broken." Or, "Have you found any bloodroot yet? or goldthread? or heard an oriole"? Something showing that she was following the round of nature with interest.

Any considerations which, under such untoward circumstances, make life not only bearable but enjoyable, seem worth taking account of.

To me, or any one who has studied the lichens and mosses, they need no apology or practical considerations to bolster up their claim to consideration. Like Emerson's Rhodora, they are their own excuse for being. To one whose eyes have not been anointed, they seem small and unimportant. I take them up together in this talk, as they are often confounded, and because their place in nature, the touches in color and picturesqueness which they give the landscape, are much the same in both.

The leaves on mosses are one cell deep, and in them first appears a vein—the first time in the evolution of leaves. The shape and arrangement of the cells is called the leaf areolation, and is very various but constant, becoming an important point in classification. By spreading out a leaf under a lens of sufficient power, as there is but a single layer of cells, we get a full view of its structure, margin, apex, &c., and these are

very pretty. The veining above alluded to is confined to a midrib, sometimes only a beginning at the base of the leaf, sometimes extending half way, or just short of the apex or beyond. It has been shown to be mainly a conductor of water, and is found chiefly in leaves of plants whose habitat is such that it has a constant supply of moisture. In these conditions, it has been found that a well-developed costa will supply the loss of transpiration. The property which mosses have of drying up and again reviving is a very remarkable one. It resides in an undetected property of the protoplasm. How remarkable that property is is proved by some artificial experiments. Severe desiccation in a drier was applied to *Barbula-muralis* with the aid of sulphuric acid, and after eighteen months, after a few wettings, it renewed growth in all its parts. A species of *Grimmia* was dried until it would pulverize, left in a drier ninety-five weeks, and again revived. This is in excess of any natural drying it could be subjected to. Mosses have developed many devices to economize moisture and to distribute it rapidly over the whole plant, so that a short, small supply of rain will do the most good, by being spread and retained.

Some, like *Dirianum-undulatum* and the *Mnium*s have a felting of hairs about the lower part of the stem, ascending more or less. The leaves are arranged overlapping or clasping about the stem so as to form a system of capillary chambers through which the water passes rapidly. In *Sphagnum* there are two sorts of cells,—one of large green cells, in which the assimilation is done, and long capillary cells which are colorless and furnished with points or pores for the rapid circulation and storing of water.

It is owing to the capacity of holding moisture and rapidly gathering it that makes mosses so valuable in the forest floor or on open plains, especially on mountain slopes, as they prevent the rapid flowing of the water, which carries away the soil. I was reading recently an account of large areas in Alaska covered deeply with mosses, which prevented the gullying and denuding of these districts.

An interesting point is that in some of the higher mosses, or

Polytrichum, a fibro-vascular bundle first makes its appearance in the middle of the stem. The faint beginning which foreshadows the giant trunk of the forest tree. Also in some capsules, as in *Orthotrichum*, quite well developed *stomata*, or breathing pores, first make their appearance.

Let me try now to give you the place in the ladder of plant life which mosses and lichens hold, and somewhat of their life history.

[This was done by the aid of colored sheets.]

This, in bare outline, is the life of a moss or lichen; but we all know that the life history of any plant means much more in the economy of nature and our æsthetic enjoyment than any such description will indicate.

As we go about out of doors, we find these plants almost everywhere. A moist climate is especially favorable to their growth, so wonderful stories are told of the beauty of mosses in our Northwest Coast.

Moisture and rather cool temperature, together, make the conditions for best growth. Still, they have a wonderful faculty for drying up and then, with returning moisture, to renew themselves quickly, flourish and improve the season of moisture, be it longer or shorter. We find some species in dry, exposed situations, as the bark of trees even in open orchards, though more often in forests on rocks, on old boards, walls, and fence-rails, roofs of houses. Some old shed roofs are verdant gardens of many species of plants. On the ground, in open, worn-out fields, we find the ground entirely occupied by *Polytrichum-commune*. What seem bare banks and trodden foot-paths are, on examination, found covered with mossy growth. Gravel pits are often nearly covered with rosy *bæomyces*.

As we examine more moist situations, we find correspondingly ranker and more luxuriant growths. Meadows where the feet sink deep into beds of *Sphagnum*; swamps where dead tree trunks are a wilderness of delight, with scores of species of delicate beauty in deep mats, velvety cushions and tiny incrustations. Perhaps the most delightful of all mossy haunts is the mountain stream. Follow the sound of the waterfall

and it will surely lead you through scenes of surpassing loveliness and interest. The cold waters of the spray keep a cool, moist atmosphere always around the rocks. Everywhere are mosses, lichen and liverwort. In the stream, *Grimmia*, *conocephalus*, *philonotes*. Half in and out the water the hand seeks satisfaction into deep beds of *Hypnun-alleghaniense*, the rank form of *Atrichum-angustatum*. In crevices of rocks the shining emerald *Plagiothe cium*, and, if one is fortunate, the rare, luminous moss; overhead *Neckera* and *Drummondia*, and on decaying trunks that span the stream, mats of shining *Imponens*, *Cupressifolium*, *and Cupressiform;* and, trailing in the water itself, long streamers of *Fontinalis* and *Dichelyma*.

It sometimes happens that a peculiar season brings rare species to light; as, a few years ago, during a very dry time, I discovered what were to me new species in the dried-up beds of ponds and wells, and, hanging from the dried-up stems of grassses and water plants about the margins. Some fine specimens of *H. riparium*, *Dichelyma Capillaceum*, *Conomitrium* were among them.

We often speak with contempt of the fields all grown to moss, as if the moss were to blame. Poor indeed is the soil indicated by the growth of moss! But we should remember that when man has taken the fertility, and the more lordly plants refuse to occupy it, the mosses begin the humble work of renewal. Even subsoil thrown up from some depth, as in ditching, digging wells and cellars, will, if left to itself, be soon covered, more or less, with a growth. I have wondered how the spore got there, whether they were in the soil or were always in the air and ready to attach themselves and start under these conditions.

It is usually the same species that I find in these places—*Physcomitrium-pyriforme*, *Bryum-argentia* and *Funaria*. These species seem to get along with the smallest quantity or no humus. A few years ago, there was a wood burnt over near us. It was an old wood, fifty years' growth at least. It had been cut off, and a fire started in midsummer, burning everything, including the cord-wood. It was dry and hot and the

fire very fierce, so everything was burned, even the soil. The ground was left in such a barren condition that plants have been very slow in taking possession again. But the first fall I noticed broad tracts form, six and ten feet wide, of thin moss growth, especially *Funaria*, its tangle of silky stems the most luxuriant I had ever seen. Another thing I noticed here was the growth of *Marchantia-polymorpha* in the burnt field. It was not the first time I had found it in association with ashes and charcoal,—once in the cellar of a burned house, and several times forming lonely circles around a deserted camp-fire in the woods.

It always interests me to find a plant or animal occupying a peculiar and circumscribed habitat. It seems as if it had such a special work to do in nature's economy. So I was interested in Mrs. Button's account of the *Splachnum*. She writes:—"In mountain districts, where cattle pass to and fro from the meadows and Alps, one notices on their halting-grounds and along their tracks moss of a conspicuous green growing on circumscribed spots. On closer examination we find we have here an example of that remarkable group the *Splachnum*, and that it has selected the cow dung to be the nutrient element substratum. Each group of emerald green *Splachnum* is strictly limited to the area of a lump of dung, no trace of it is seen elsewhere, all the stages of development of this moss following each other in the same substratum. First of all, the lumps of dirt, which are kept moist by rain or standing water, are enveloped in a web of *Protonema*, and their surface acquire thereby a characteristic greenish lustre. Later, hundreds of little green stems, thickly clothed with leaves, emerge, and the spore cases, which resemble tiny antique jars, and are amongst the prettiest exhibited in the world of mosses, become visible as well." Other species of *Splachnum* vary their habitat so far as to occupy the excrement of the chamois, the reindeer, birds of prey. One specimen was found in the foot of an old stocking, another in the skull of a musk ox. Still another in the skeleton of a hedgehog.

Each season has its own peculiar charm and its own special

plants to offer for the students or admirers of nature; and the mosses and lichens seem to fill a gap which would otherwise be vacant. After the last blossom has gone, when mushrooms, even, are no longer found, save, perhaps, a few blackened brick-tops or *Omphalia-campanula* around the frosty stumps, when the fall rains have been with us, and the nights are cool, then the mosses and lichens are at their best; they soak up the abundant moisture, put on their greenest colors, and send up their tiny fruiting capsules. Now is the time to collect for winter study. On starting out for a tramp, supply yourself with a number of small paper-bags. On finding a specimen you wish to preserve, put it in its bag, with something to indicate the substratum on which it was found, pin to and put in pocket or bag. On reaching home, add dates and place and pack away without further care. In the winter, when you wish to study your mosses, wet them out thoroughly and they will be as fresh as if newly gathered. They keep indefinitely dry, and stand considerable hard usage.

In these late fall days, and again in the time of the spring rains, and, indeed, all through the winter, during milder intervals, whenever we hear the drip, drip on the roofs, we know the mosses are waking up and we can look out to such renewal and enjoy the rich colors they take on. The lichens, especially, are dull, lifeless-looking things when dry; but, with a good soaking, become changed, as with magic, into richest colors. No gaudy primaries, but rich secondaries and tertiaries—olive-green, sage-green, apple-green, grays, mauve, ruby, bronze, orange, with dots of bright colors.

A friend was being shown over the new house of a wealthy ex-governor. She particularly admired the coloring of the walls, draperies and carpets. She was told that the designer was a real artist and did really what so many claim to do, but in reality do so seldom, copied his colors directly from nature. I have been told that Worth and Doucet do the same, and have read descriptions of their costumes named from natural scenes or objects, as for instance, one was a lichen costume. Surely, one could not copy any colors with greater security in produ-

cing harmony than the ones we see on the trunks of the elms, ashes, on the stone-walls and fences after a rain.

There is on Mt. Pisgah a rock covered with a rich growth of *Umbilicaria*, which is worth a visit after every rain. The boulder is covered with the delicate apple-green folds or ruffles, which fall in frills, showing the rich underside, which is black and velvety. It is the lichen, I think, which Mr. Bolle refers to in his description of a lichen which covers the peak of Mt. Chocorua. He calls it the burnt paper species. He describes himself as going out into a swamp during a heavy thunder-storm to see the effect of the rain on various things. Among other phenomena he sees this :—

"Presently a vista opened northward, and at its end rose the dark peak of Chocorua. After a rain, this towering rock presents a noticeably different appearance from its normal coloring. Most of its surface is covered by lichens, one species of which, when dry, resembles burnt paper. When rain falls upon them, these lichens alter their tints, and the burnt paper species in particular becomes so green that a wonderful change takes place in the whole coloring of the mountain."

How many lichens are associated with our country walks, perhaps, unconsciously! The *Cladonia*, or reindeer moss, that crackles with crisp brittleness as we climb the hill pastures in summer; another *Cladonia* with tiny goblets, my father used to tell us children, were "fairy wine-glasses," and the little vermilion-tipped species near by, the "fairies red-apple trees": the *Cetraria*, found so abundantly in old pine trees; *Peltigera*, conspicuous among the green mosses in spring; *Usnea*, that cosmopolite that drapes the trees of the swamps like Southern moss, and sacred to all bird lovers as the chosen material of the nest of that dainty darling the Parula warbler; *Sticta*, whose curiously-shaped and mottled chalice doubtless suggested the likeness to and hence the healing of the lungs; *Parmelia*, whose circles of crimped, close-clinging tissues, slowly enlarging from year to year, form, with the rocks and fence-rails on which they grow, one of the most familiar backgrounds which the New England nurtured eye takes in. And

so we might go on, but "I don't quite like the cat'log style, dew you? As if to sell off nature by venders."

In closing, no talk on mosses and lichens would be complete which omitted those beautiful lines of John Ruskin:—

"Lichens and mosses—meek creatures"! &c., &c.

9th February, A. D. 1899.

ESSAY

BY

E. L. BEARD, Boston.

Theme:—Hardy Herbaceous Plants.

The lack of interest in this branch of floriculture and gardening in America is to be deplored. A keen faculty of observation on the part of the horticulturist is not requisite to detect the fact that in every quarter, what are popularly known as bedding plants have so far usurped the place of their less obtrusive relatives, hardy herbaceous plants, that the latter are to a large extent unappreciated, because forgotten and unknown.

These remarks apply not only to hardy plants but to some beautiful things not altogether hardy, but such as the gardener whose love for his profession rises above the mere drudgery often incident to its pursuits, may, with the aid of cold frames and coverings, protect through our trying winters with comparative ease, being more than recompensed in spring and summer by the unique beauty of blossom with which some of the more tender are favored. I have set the two classes of plants, the hardy and the more tender bedding plants against each other for our consideration and comparison. The latter includes Geraniums, Coleus, Alternantheras, Pyrethrums, Lobelias and others, and depends for effect on color and strong, often glaring, contrasts.

Such displays show favorably in certain locations, but in this country, where gardening as an art is still something of a weakling, these pleasing horticultural pictures must necessarily be confined to the gardens of a few wealthy persons.

Bedding out, as generally practiced by the amateur and

gardener is like the first attempts of a tyro in painting, crude and inharmonious. There will be found a yearly recurrence of the monotonous ever-blooming reds and yellows with a few inconspicuous and dingy intermediate colors which in summer drought or in heavy rains assumes a forlorn aspect upon which the curtain is dropped by a sharp frost early in the season.

A more general insight into the beauty and adaptability of hardy plants and bulbs, and a more practical study of their habits and requirements on the part of the gardening craft at large, would ultimately lead to such an exposition of beauty in our garden borders that the wearisome round of bedding out and the monotonous recurrence of its short lived display would become not obsolete perhaps, nor would I have it wholly so, but at least subordinate to the more refined and satisfactory culture of hardy plants and bulbs. For general cultivation would recommend Crocuses, Tulips, Hyacinths, Grape Hyacinths, Narcissus in variety; Iris, English, Spanish, German and Kæmpferi varieties; Pæonies, Chinese and Japanese varieties; Foxgloves, Canterbury Bells, Hollyhocks, Delphiniums, Phlox, Lilies, Rudbeckias, Helianthus, Spireas, Clematis, and many other varieties of flowering plants; also grasses like the Eulalias, that are very ornamental.

16th February, A. D. 1899.

ESSAY

BY

Mrs. A. E. WHITAKER,

Editor of Woman's Interest, New England Farmer and Grange Homes.

Theme:—Antiquated Premium Lists.

The annual visit to the cattle show on Old Sturbridge Common is one of the earliest memories of my childhood. Although mine was a village home, its productive garden and the housewifely skill of my mother and grandmother were nearly always represented in the hall. This early gave me a vital interest in the exhibition.

The anticipation and realization of the annual fair have lost nothing by the flight of years, but there has come to me the experience to form a more intelligent criticism and a better sense of values. The development of the primitive village cattle show of my childhood's remembrance into the grand jumble of fakirs, sideshows, races, vaudeville exhibits, midways, balloon ascensions, base-ball games, firemen's parades and gambling, along with grange speakers, governors, dairy cows of national fame, birds of proud plumage and a hundred other attractions of the up-to-date fair, in some respects has been abnormal. Some great advances have been made, but not all of the transformation has been progress. Much thought has been given to the modern cattle show by the best friends of agriculture, while columns of newspaper literature have been printed about it.

My own thought has been directed towards that department usually given to comprehensive name of woman's work. Here the progressive spirit of the age has failed to make its full

impression, and development, whether for good or bad, has been less marked than in other departments.

If the farmer were to enter in this year's fair the counterpart of animal, fowl or produce which he took to the old cattle show, with no record of pedigree, feed or method of growing, he would find himself absolutely nowhere; though his exhibit would doubtless be ranked properly by expert judgment given deliberately. He could bank nothing on his being a friend of Deacon Smith, Farmer Jones and Neighbor Brown, acting as a committee and endowed with the weakness of human friendships, prejudices and enmities.

His wife, however, might carry the selfsame bedquilt or rug that her ancestors did and stand a good chance of drawing a premium. This condition may have exceptions; but a close study of premium lists and exhibits shows that the modern agricultural fair has developed faster in all other departments than in the household branch. The same time-consuming bedquilts of 9999 pieces, and ephemeral, gone-by fancy-work fads are listed as commendable accomplishments to be encouraged by money premiums.

It is decidedly non-progressive to encourage women and girls to spend time on what is neither useful or decorative or without money value.

Why, for instance, should a premium for "the best bedquilt made by a girl under 12" be continued as it is in ninety per cent. of lists? You would not expect the city girl to sit and sew together inch pieces of print. Her mother would teach her sewing by allowing her to cut out a simple garment by the convenient and cheap paper patterns and helping her over the puzzling places and stitches. If I think too much of my daughters' health to compel them to "sit on a cushion and sew up a seam" like the lady of long ago, why should other country girls grow round-shouldered slaves of the patchwork quilt. Yet one society in this State offers a one dollar premium for a single block of patchwork.

There yet exists a trace of the old notion that farmer folks must *be* different and *do* differently from other folks. It shows

plainly in the survival of certain things in fair premium lists. Why should the country home be encumbered with the dismal hair wreath in a glass case, the cross of shells glued on to a pasteboard foundation, or feather flowers dyed in bright hues? In reality very few are. Yet these old-time fads are still awarded money prizes in Massachusetts fairs. They are positively inartistic and should be eliminated.

Next to the things, the making of which is almost criminal waste of time, come the things which have a use but which the whim of fashion pronounces out of date. The premium lists should also be pruned of these. When lace-edged table covers of white linen are the exclusive fashion don't offer a dollar for the best table scarf embroidered with arrasene, for such went out of date before some of the present exhibitors of needlework were born; yet half the premium lists in the State carry this item along, conveying the idea that this work is still in favor. Most lists still have large premiums for white silk embroidery on flannel such as our mothers took pride in working but which is a minor accomplishment today.

Fortunately not all country women are deceived in such matters; as a rule, thanks to more steam and trolley cars, they go about more than ever before, and see what is being made and used. But such antiquity causes them to lose faith and interest in the hall exhibit. They get to thinking and saying, "Oh, there 'll be the same old lot of crocheting and baby socks." In this way some of their influence and aid to the fairs is lost. If the modern fair is to be improved woman's help should be secured, but it cannot be done by encouraging time-killing follies, by trying to perpetuate the fads of a former generation, or by recognizing the inartistic creations of more primitive times.

These are some of the errors and the result.

What shall we substitute?

A small proportion of premiums should be offered for the trifling decorative novelties, of present but not lasting favor. The greater part should be reserved to encourage work of real merit including the union of artistic and useful.

Wouldn't it be better to omit premiums for out-of-date picture throws, embroidered banners, painted placques, hair wreaths, lambrequins and that ilk, and encourage the making of more modern and of useful things. Take dressmaking for instance; many women wear a "store" wrapper, or an ill-fitting gown of their own creation as they work at their embroidery. The ingenuity and skill and the artistic sense required for the delicate fancy work, if properly directed, would fit and make a dress. More premiums should be offered for hand sewing and for well cut and made wearing apparel. One society is to be commended for its premiums for the best twelve or six pieces of hand sewing. Encourage the young girls by a premium for the best shirt waist, or its equivalent as fashion changes; this would illustrate all the stitches of plain sewing. The neatest lined and finished cloth skirt and the best made dress designed especially for housework would be other practical exhibits, from which of course the professional dressmaker would be barred out.

Women have been knitting golf stockings for several years but I fail to find these articles recognized in any premium list. Fire etching on leather and wood has been popular for several years and is capable of a high rank in decorative arts but it is almost entirely overlooked in the department of fine arts at the fairs. One who is skilled in the embroidery of household linen with monograms, crests and initials, and in making needle and bobbin laces, has an accomplishment which is a pleasant possession and may bring her substantial reward where a thousand yards of crocheted edging of the prevalent inartistic designs would yield nothing.

Work of commercial value should be encouraged. In connection with my editorial duties many letters come to me with the request that I help the writers to earn something by work at home. These letters are often pathetic and force one to close study of the problem involved. My question of what the writer can or wishes to do is usually answered by "fancy work" for which there is practically no market.

The farmer has been encouraged by the agricultural societies'

rewards to keep better cows and raise finer fruits; thereby he can cater to a critical or exacting market and get more money. His wife, in moments taken from household duties, has spent some of her energies over passing fads, usually without merit, or has followed a rut in which she has learned little of marketable value. The agricultural fair has been no help to her.

A somewhat extended movement is being started in the Middle Western States to make woman's work done at home in her spare time more remunerative. The marked preference for good hand work over machine-made products favors such a scheme. It originated with Mrs. Candace Wheeler of New York city who has no superior in her success in applying decorative to industrial art. She has established as a paying occupation in isolated or village homes in certain parts of her own State the making of portieres woven from scraps and pieces; these are a sort of artistic rag carpeting converted into draperies. I do not remember having seen a premium offered for these portieres yet they are found in the most elegantly furnished houses, bring a good price because they are hand made, and cater to the exclusive taste because it is about impossible to repeat the design exactly.

Rag carpets are among the old fashioned things which are not gone-bys, and through correspondence with Mrs. Wheeler I find that she agrees with me that premiums should still be offered for them, especially when woven in the mixed pattern and where no gaudy cheap dyes are used. There is a limited demand for this floor covering in houses which have one old-fashioned room; artists like it for studio floors when it is not of aggressive pattern; and in the country house it is always in keeping.

Mrs. Wheeler also writes to me of women who are making and weaving blue and white washable rugs for bathrooms and sleeping-rooms, which are excellent in every way and are salable. Braided floor mats, if well made and subdued in color, are always worth a premium, as they are serviceable and assume to be nothing more than what they are. With apologies to the one-fifth, what can be said of four-fifths of the drawn-in or

hooked rugs exhibited at fairs in which all beauty of design or color is lacking. Yet a New Hampshire woman, trained as a designer, has succeeded in working up a paying business in these rugs made under her own artistic supervision. . There were many obstacles to progress in her undertaking by reason of an uneducated taste. Eyes accustomed to impossible cats and dogs, as well as to lilies and roses of poor design and glaring color, as wrought in the average home-made rug, were not prepared to look with favor on conventional patterns in subdued, æsthetic colors. She was compelled to work out her own ideas, and the adaptation of color schemes from high-priced imported rugs, upon a sufficient number of rugs for an exhibition. She had also to prove by the sale of, and orders for, her work that it appealed to people of artistic taste with means to gratify it. In other words, she had to break down the false standards which have been sustained by the premiums awarded at fairs for years and years. Surely the quality of home-made rugs might be improved at fairs if a judge could be found with backbone enough to discard all but the worthy. The premium list ought to help her by prescribing conditions.

There is room for improvement in the bread exhibit, which, as I first remember it, consisted of white and baked rye and Indian bread. Innovations came in steamed brown bread, graham bread and then cakes, until now the cake part is the leading part. There never was a New England farmer's wife but excelled in cake making; it seems to be a universal gift in this section of the country and very little money ought to be expended in encouraging greater feats in this line. It might be urged that good premiums are already offered for bread and that most women prefer to make cake and take greater interest in it. The remedy lies in creating more interest in bread making; *lack* of interest is the cause of so many poor bread makers. The mysteries of fermentation and chemical changes have not attracted their thought or study. It would be better to give three dollars for the best loaf of bread than one dollar for a cake, as is sometimes offered.

Does anyone doubt that housekeepers would take interest in an

exhibit where there was offered a sweepstakes premium for the best bread, and in addition three first and second premiums for bread made with home made, compressed and dry yeast? Add to this, distinctive premiums for graham and entire wheat, which are not the same although often classed as one. Then might come the various kinds of rye and Indian, rolls and biscuits.

The New England man loves pie even if pie is not an adjunct of the fashionable dinner. It may be daring to say that here in the great pie belt; the home-made pie is seldom well made, and a number of premiums for toothsome pastry would probably set cooks to experimenting until undercrusts were as light as uppers. A few societies make one or two additions to the articles named.

Accuracy ought to be encouraged in cooking exhibits; but in looking over the recipes which are sometimes required to be sent with them I seldom find one so complete that I dare to print it. "Sweeten to taste" or "flour to mix" convey no instruction. The written recipe should be as exact as a druggist's formula, and should always be required.

In this connection allusion is proper to the effort now being made to establish in connection with the national department of agriculture, a bureau of domestic science in which investigations as to methods for the preparation of food shall be conducted and the information printed for distribution in the form of bulletins. The movement started in Illinois and the advocates of this plan call attention to the fact that colleges are established throughout the country where every facility is provided for education in the *production* of food material; State fairs have generous appropriations and institutes are conducted for further consideration of this question. The best results of all this effort and expenditure may be, and often are, ruined by the ignorant or careless cook. The Illinois State fair introduced a department of domestic science in 1896 and continued it at following exhibitions. A domestic science committee had a large corn exhibit at the corn convention in Chicago.

Managers of fairs ought to keep in step with such movements and can much better afford to give less premium money for

decorative monstrosities, and add something for illustrations of what may be done to make fruits and vegetables more acceptable and nutritious as foods.

More attention should be paid to increasing the uses of New England fruits and vegetables. The wholesome apple ought not to be so largely supplanted by the orange. Who knows, for instance, what a prize offered for a new confection made from apples might bring out from inventive cook's experiments. Evaporation is a much easier method of preserving than canning. Yet beyond a few articles, which even the earliest settlers of the country prepared in this way, little success has been attained in saving products of the farm and orchard by drying. With handy stove evaporators there is ample opportunity to save some of the fruits and vegetables, which might go to waste if there was no other way of saving them than by canning.

Along with this might be added an exhibit of how the dried article would look and taste after the cook has done her work properly. Part of the popular indifference to dried food of this kind is due to lack of knowing how to restore the moisture without losing the solidified juices as they dissolve or without breaking up the more solid part into an uninviting mass.

No man cares whether he sleeps under a patchwork quilt of ten or ten thousand pieces, but it does concern him whether his dinner be good or whether what he provides is used to the best advantage. At least until the government sees fit to aid in spreading knowledge on this subject it appears to be the duty of fairs to encourage and reward better methods of feeding people as well as animals.

Not long ago, a man having wide knowledge of agricultural and horticultural interests, urged me to write more in favor of encouraging children to compete for prizes at fairs. Premium lists show a diversity of custom in this respect, and some have special prizes for school work. Theoretically there could be no better way to encourage nature studies and manual training. Even when not under the supervision of teachers or limited to school work the plan works to a charm. The boy raises a fowl, some choice berries, or completes a creditable bit of wood

carving, all, as the children say, "his own self." The girl carefully stitches an apron, or mixes and bakes her bread or cake without supervision and the slight expense of rewarding their effort is money well laid out. In some localities it is all the encouragement that they get for manual training.

But there is another side where the whole family combines to send its best in the name of the child, who thus learns a large lesson in deceit and falsehood, and if it secures a prize is encouraged to repeat the experience. I have seen a loaf of frosted, rich, fruit cake accredited to a child and given a premium; the written recipe attached was so indefinite as to have been no guide. One can easily imagine the child, working mechanically under direction of a practiced hand, hoping by this proxy to gain the coveted prize.

The best classification of children's work is that given by one society, which calls for herbariums of flowers, grasses and ferns respectively, collections of 75 and 100 specimens of wood, geological collections, agricultural and horticultural products, also cookery, sewing and the arts of wood carving, drawing and painting as taught in the public schools.

Leaving the details of the premium lists I would make a few general suggestions.

Let the standard in these classes of exhibits be so high that the award will mean something; if nothing deserves the first premium then it should not be awarded. The clause giving committees or judges the right to withhold any premium, if in their judgment none is deserved, means little to the average three people who distribute awards, and if but one lone chrochet tidy is entered it receives the first prize although it be a caricature of its kind.

The judge should be an expert whose opinion would count for something. A woman is not fit to judge needlework because her husband is a man of some local prominence or because she has a reputation as a good housekeeper. I have known good bread to receive no notice because an inexperienced judge "didn't like that kind." The judge for the exhibition of cookery should be a graduate of the normal class of some

cooking school of good standing. Such a person can detect the slightest overfermentation of bread or the smallest variation of texture in cake. I have in mind one such judge whose rapid but systematic decisions, according to a scale of points, were above question.

In no department is a qualified judge more needed than in that of painting, drawing and decorative design. Without an expert, false standards are made for those out of reach of the influence and advantages of art exhibitions and schools.

A problem for the management of fairs is the comparative value and claims of the professional and the amateur exhibitor. A list offers first and second premiums for ten to twenty different articles. The judge finds a large and beautiful exhibit of needlework, covering all branches specified in the list and a great attraction to visitors. She starts upon the task of judging, has a scale of points for shading of colors, setting of stitches, beauty of design and so on. If strictly impartial she must award every first premium to the exhibitor who is well known as a teacher or dealer. In her heart she believes that the award should go occasionally to the woman who has sent her one masterpiece made at home in spare moments and which falls but a shade lower than the work of the successful professional.

But the judge must not let sentiment influence the award. The professional's work is doubtless a great attraction to visitors and is an object lesson to those who do that particular kind of work; it is too valuable to be dispensed with because it tends to raise the standard of the exhibit both in quality and by the introduction of new ideas. On the other hand less skilled workers are apt gradually to withdraw their efforts because of the certainty of being outdone, for it takes courage to submit one's handiwork to the chances that await it under these conditions. A remedy lies in the larger societies offering separate premiums for professional and amateur work, and in the smaller ones either barring out the professional or giving a gratuity on such collections or exhibits. This leaves the money encouragement and the grading of prizes where it belongs.

This reference to the product of the needle may apply as well to the brush. In the art department a few societies already

discriminate between amateur and professional work. Copies and originals are classified and thereby comparatively just decisions are made. But this is an exception to the prevailing custom where clever copies of the familiar three horses' heads at the drinking fountain or a branch of oranges, worked out possibly under the supervision of a teacher, is given a premium while an entirely original study is passed by.

The tendency in all great expositions is to omit a distinctive department for woman's work. This came about partially by the wish of women themselves to earn, not the commendation of having done "very well for a woman" but the reward of being "best of all."

While the State, county and town fairs do not specially classify their hall exhibits as woman's work the general interpretation is such. A better classification would be Domestic Science, Industrial Arts and Fine Arts. The first would develop from the present few loaves of bread or cake and jars of pickles and preserves into an instructive exhibition of cookery, preserved and dried fruits and vegetables, appliances for household work, demonstrations of cookery, exhibits of table setting, household inventions and so on. Men could compete for premiums if they liked, and could have attractive and instructive exhibits as they do in food fairs and in the great State expositions.

The industrial art department ought to be guided towards what is of use and to the things that the world needs and will buy, while the standard of the fine arts should be kept as high as consistent with existing conditions.

All plans of instruction and entertainment are the result of evolution as the world has grown older and better ideals have advanced. The schools that were good enough for our fathers or for us, are not good enough for our children; the clumsy stage appointments of an old-time theatre would meet ridicule today; even the preacher has changed methods, if not texts, else he would be left alone with his eloquence. Why should the agricultural fair so often cling to primitive plans in that which should interest women and which could be of much profit and improvement!

9th February, A. D. 1899.

ESSAY

BY

JACKSON DAWSON,

Of the Arnold Arboretum.

Theme:—Propagation of Trees and Shrubs.

There are many methods of propagation, the most natural one being from seed. Plants, as a rule, grow strong from seed and live longer than those which are grafted, and where it is practical to do so the growth of plants from seed is the best method; but there are exceptions to all rules and many trees, such as Willows and Poplars, grow as readily from cuttings and produce equally as good plants as those from seed. Species, as a rule, come true from seed, or nearly so, but there are many variations which we wish to perpetuate and these must be increased by other methods, such as grafting, cuttings, layers or inarching. In growing plants from seed it is important that the seed should be selected from good healthy plants, and if grown in a cooler climate than that in which you intend to grow them they are apt to be more hardy than seeds taken from a warmer climate to a colder one. If possible, this should be the reverse. We know for a fact that many evergreens from California and Oregon are not hardy here, while the same species from Colorado or other high latitudes are perfectly hardy here.

Picea Engelmanni, Abies concolor, Picea pungens, and the Douglas Fir (Pseudotsuga taxifolia), the latter which was imported from England, would not stand our climate, these being grown from seed collected in California and Oregon, and not until Dr. Parry sent seeds from Colorado did we have hardy forms of these trees in New England. At the present day all

seed of these trees for northern growths are collected on the eastern slopes of the Rocky Mountains, where the summers are hot and the winters are cold. Hence the necessity of having the seed from the best trees near by or from those grown in similar climates. Seeds should be as fresh as possible, and the sooner they are cleaned and sown the better results. Many seeds which would germinate the first season if sown as soon as gathered, would lay in the ground until the second season if thoroughly dried before sowing.

Of course when seeds have to travel a long distance they must be thoroughly dried or they are apt to mildew and spoil. Many seeds, such as Cherry, Plum and Peach, unless subject to hard freezing, will not germinate the first year. Many will not germinate until the second year under any artificial condition, and often seeds will lay in the ground three years and then germinate. It is well, if you have not the ground in the condition to plant, to stratify all seeds as soon as cleaned, that is, put them away mixed with layers of sand or earth and keep them in a cool cellar or frame until spring. When small quantities are used they can be put in small boxes and mixed with sand, or if large lots they can be stratified out-of-doors. It is well to have the sand or soil used fine enough to run through a sieve. By having different sized sieves the seeds can easily be separated from the sand.

In all large nurseries, where there are quantities of Peaches, Plums, Hawthorns, Cherries, Lindens and Junipers, the seed is mixed with piles of earth on the surface of the ground, stacked up, left covered with sods or boards until spring. Such seeds as Honey Locust and other hard and bony seed which have become thoroughly dried, should be treated with hot water (so as to swell before planting, otherwise they would come up scattered at intervals for several years).

The first consideration is what you desire to plant; the second, to have the seed as fresh as possible; and the third, soil and situation to plant in; the fourth is to know what depth to plant the seed and how long to wait for the seed to come up. In this sort of a paper it is hard to give many details, so that I

will touch on the most hardy of the different genera and leave the varieties for another time.

Maples, Magnolia, Horse-chestnut, Mulberry, Alders, Plane-tree, Birches, Amor-cork, Hornbeam, Oak, Hickory-nut, Plums, Chestnut, Willow, Catalpas, Viburnums, Redbud, Picea (Spruce), Yellow-wood, Abies (Firs), Hawthorn, Pines, Beech, Aralias, Ash, Barberries, Holly, Siberian Pea-tree, Tulip-tree, Cornus, Clematis, Bladdernuts, Euonymus, Snow-berry, Hibiscus, Hypericum, Ligustrum, Pyrus, Kerria, Roses.

SOIL AND SITUATION.

In selecting a place for the seed-beds the soil should be a deep rich mellow loam, avoiding gravelly soils or heavy clays. The soil should be well manured with good rotten manure a year old, then ploughed or trenched twelve to fifteen inches deep and well pulverized. All coarse stones and rubbish should be cleaned off so as to have the land in the best possible condition. If the land is full of weeds it would be well to manure heavy and plant one year with crops that would be well cultivated. Nothing tries one's patience more than trying to grow seedlings in a soil that is already full of weed seed. If possible, the land should be sheltered from the north and west by fence or hedge. If the seed is to be sown broadcast I should lay out the beds five feet apart with a pathway two and a half feet between the beds. This will give ample room to weed the beds from each side. If sown broadcast, rake the beds smooth and sow the seed thinly and evenly over the surface. If the seed is fine, raking them in with a coarse rake and rolling them lightly will be sufficient. If the seed is large, it should be covered about its own diameter. For myself I prefer to sow in rows eight inches apart, across the bed, especially if there is a large number of varieties and only a few of each wanted, or in long nursery rows, eighteen inches apart, if to be worked by hand, or from two to three feet if to be cultivated by horse-power. One reason I prefer the rows to broadcast is because they are much easier to cultivate.

Seed should never be sown when the ground is wet. The

soil at the time of sowing should be neither wet nor dry, but in such a condition that it can be raked without its clogging. If it is too wet many fine seed will scarcely come through, while if too dry the seed is apt to work out, unless covered deeper than desired.

A supply of water should be at hand, ready to be used on all lightly rooted plants during dry weather. It is also well to have lath screens to protect delicate plants from the hot sun. If in the fall we begin with the Oaks, as the acorns do not long retain their vitality (neither does Chinquapin, Chestnut or Beech) ; to insure success these should be put in boxes of earth or sand, as soon as gathered. If sown broadcast, the nuts should be scattered thinly over the bed and pressed down with the back of a spade or a light wooden roller and covered a little more than the diameter of the seed, which should be over an inch for the Beech and Oak, and two or more inches for the Hickory. Some prefer making shallow drills with the plough and sowing thickly. The Maples, with the exception of rubra and dasycarpum (these ripen in June), should be sown as soon as possible after gathering, otherwise they will not come up until the second year. The Ash must also be sown as soon as gathered, otherwise it will not come up until the second year. Carpinus, Ostrya, Cornus florida, Amelanchier, Celtis and Viburnums seldom come up until the second year. The Redbud, Kentucky Coffee-tree and Yellow Wood need to have boiling water poured on them, letting them stand for twenty-four hours, then take those that have swollen, which are considered fit for sowing, and treat the rest to a hot bath again. The Ailanthus, Catalpa, Mulberry, Birch and Alder are best sown in spring as soon as the ground is dry enough to work. The Red and White Maple, the Elm, and Betula nigra ripen early and should be sown as soon as gathered, and if well cared for make good plants the first year. Magnolias should not be sown out-of-doors until the weather becomes warm. The Holly seldom comes up until the second year. Such seed as that of Magnolias, Roses, Mountain Ash, Celastris, Viburnums, Amelanchiers, and all fleshy, pulpy seed I macerate in water and wash out,

and sow or stratify before they are dry. When seeds are sown in the fall, as soon as the ground is frozen cover the bed with a light covering of hay or pine needles, which will keep the ground from heaving and the heavy spring rains from washing up the seed. If closely looked after, the covering may be left on until the seed shows signs of germination, when it should be carefully removed. All seed-beds and rows should be kept free from weeds, and as soon as seeds are up the ground should be hoed or cultivated frequently. This causes the young plants to push more vigorously and makes them better able to withstand the drought. If the weather is very warm and dry the seed-beds should have a good soaking of water once or twice a week, and in the case of delicate seedlings they should be screened during the heated term or until the plants are deeply rooted, when they may be gradually inured to the weather. After the first of September all watering should be stopped and the plants should gradually be hardened so as to go into their winter quarters with well ripened wood. At the approach of winter those sown in drills will stand better if a plough is run between them, throwing a furrow against the stems. This keeps the young plants from heaving with the frost, and also keeps the water and ice from settling round the young stems, which often causes great injury. All the others should be mulched with leaves or short manure.

Most all deciduous plants should be transplanted the following spring if good shapely plants are desired. In my own work I sow most of my seeds in boxes, as I find it more convenient where I desire only a few hundred of a kind. They are far more easily handled and the plants, especially nuts and oaks, transplant more readily and with little or no loss. I call it the box system. I procure a lot of boxes at a grocery store, of as uniform a size as possible, for they pack better in a six-foot frame than various sizes. Canned goods or soap boxes are nearly equal in size. With two cuts of the splitting saw you have three flats about three and a half to four inches. With one-half inch auger I bore four or five holes in the bottom for drainage. For the finer seed I drain the boxes with broken crocks, with

coarse siftings of peat or sod, or any coarse material that will allow the moisture to pass off. Then I make a compost of two parts rotten sod, one of peat and one of sand, and fill the boxes with the compost and press down firmly. Sow the seed evenly and cover according to its size. On one corner of the box I plane a place, rub over with white lead, and write the name of the seed and date of sowing. This takes only an extra minute, and is of much value afterwards.

After sowing, the seed should have a good watering to settle the soil. The boxes can then be piled four or five deep in a pit, or placed in a greenhouse. If in a pit, as soon as the boxes are frozen, they should be covered with leaves to keep them so until spring. If no pit is available, they may be piled in a sheltered place and covered with leaves or other litter. In case of the seeds which take one or two years to germinate, it will be well to cover the boxes with boards, so that squirrels and mice may not get at the seed. About April, put the boxes in frames where they can get the morning sun, but not in a shady place. Cover them with pine needles or sphagnum moss, which will save a great amount of labor and watering. Winter the first winter in a deep pit, slightly covered with leaves or meadow hay. If no pit is available, three or four inches of pine needles or leaves placed over them will keep them in good shape until spring. But on no account should the boxes be left without protection, as the young seedlings will suffer very much in so little depth of soil. These boxes are from fourteen to sixteen inches square and will hold from 100 to 200 plants, according to their growth. The conifers, such as the Pine, Spruce, Larch, Cedar and Hemlock, require more attention and care. It is almost impossible to grow many of the finer kinds in our New England climate out-of-doors, although with care many of the ordinary conifers can be grown out-of-doors. The seed may be sown thinly, in rows or broadcast, about the 20th of May, slightly covered, certainly not more than twice their own diameter. If sown broadcast they should be lightly raked in and the bed rolled with a light wooden roller. The beds should be covered with screens to protect the young plants, partly from the sun

and partly from the birds which often pick up the young seedlings which are just breaking ground. If no laths are handy, the beds can be covered with Pine, Hemlock or Cedar branches. As soon as the young plants begin to appear the branches should be raised some inches above the ground. It is a good plan where pine needles are plenty to cover the beds thinly between the rows with them. This keeps down the weeds and saves much watering.

The critical time for young conifers is the first three months of their existence, until they have made a crown bud. After that time there is very little danger. A great quantity of rain or a scorching sun will often prove fatal to thousands. Stirring the soil after heavy rains or sifting dry soil among the beds of over-wet seedlings is a great benefit. After the muggy weather of August is passed they require very little care for the rest of the year. Pines should not stand more than two years in the seed-bed unless sown very thin. The White, Black and Norway Spruce will hardly be fit for transplanting until the second year. The Larch and Arborvitæ should be transplanted after the first year. The seeds of Juniperus and Taxus do not germinate until the second year. The Stone Pines lie on the ground until the second year, although a few may come up the first year. The seeds of conifers, with the exception of the Silver Firs, will, if kept in a cool dry place, retain their germinating powers for a number of years. White, Scotch and Austrian Pines and Pitch Pines come up fairly well after being kept five years, and might possibly have been several years older when received.

I have found by experience that too much moisture is fatal to the germination of old seeds, and especially resinous or oily ones. If sown in a soil barely moist and covered with dry sphagnum to prevent the escape of the little moisture in the soil, many will grow, while if treated in the ordinary way, the seed will swell and then rot.

Many shrubs and trees can be grown from cuttings of old and new wood, also by cuttings of the roots. Many trees and shrubs otherwise hard to propagate by cuttings of the hard or soft wood are easily propagated by pieces of the roots. The

Elm, Ailanthus, Plum, Pea, Apple, Hawthorn, Cherry, Mountain Ash, Acanthopanax, Aralia, some Cornuses, Philodendron, Xanthoceras sorbifolia, Nyssa multiflora, and others are examples. Most of the shrubs are easily propagated by soft wood, that is the growing wood, in summer-time under glass, while most shrubs root readily from the young growth but few of the trees will. The trees to root most readily from hard wood are the Willows, Poplars and Plane-trees. Of the shrubs that root most readily from hard-wood cuts are most of the Loniceras, Hydrangea paniculata type, the Forsythia, Philadelphus, Tamarack, Privet, Spiræa, Sambucus, Rosa setigera and Rosa lucida, Carolina, mannetia, multiflora, repens and Wichuriana are the most easily rooted among the Roses; many of the Roses it is almost impossible to grow from hard wood. Ribes, that is currants, and Gooseberry, Cornus of most species, a few of the Viburnums, such as tomentosum dentatum and varieties, Actinidia, most of the Grapes, Althæas, Wigelias, Deutzias and some others. Many plants root much more readily from the green cuttings in summer than by hard-wood cuttings, all the Viburnums, Cornuses, Ailanthus, Privets, Iberis berberis, Euonymus, Spiræas, Actinidias, Gordonia, Syringa Chinensis, Caryopteris, Daphne Mezereum, Deutzias, Philadelphus Stephanandra, hybrid Lilacs and others.

Fall is the best time to make hard-wood cuttings, although if they are taken any time up to the middle of March they will do well. The best height of most cuttings is five or eight inches. Willows and Poplars may be much longer and thicker than those of the shrubs. Good clean new growth of the previous year, well-ripened, makes the best cuttings. I always like to cut the cutting smooth just below an eye. Although it is not always necessary, as soon as made tie up in bundles, say forty or fifty in a bundle; if the bundle is too large they are apt to heat. I usually use copper wire to tie them as string is apt to rot, and then follows confusion if you have many varieties. If your ground is dry and well sheltered the cuttings may be planted in the fall, otherwise it is best to heal them in winter, the butts near the surface, and cover the whole several inches deep; and

over all a good covering of manure or leaves to keep them from freezing too hard in the spring. They can be planted out in nursery rows or frames. If in frames, the rows need not be more than eight or ten inches apart, and the cuttings three or four inches apart in the rows; if in nurseries, the rows may be three feet apart if to be worked by horse-power, less if otherwise. The soil should be deep and good, and if heavy or wet well drained. Plant the cuttings to within one or two eyes of the top, and if the weather is dry they will require watering several times until well rooted. Keep them well cultivated and most of them will be good plants by fall, and at the end of the second year fit to plant permanently. Where cuttings are healed in inverted, as I have spoken of, they callous much quicker and the tops are not so liable to start into growth so quickly as they would otherwise, thus giving the cutting great advantage over the one which is planted at once in the proper place without this treatment.

In the growing of soft-wood cuttings a greenhouse or frames are necessary. They can be grown in boxes, pots or on a solid bench. I prefer boxes three to four inches deep, and well drained; they are much handier than having the cuttings in the solid bed, as they can be moved to different positions if needed. Also if necessary they can be transferred to frames as soon as rooted, to harden them up without disturbing them. The soft cuttings will need much more attention and care than the hard ones will, but in many cases I think they pay the best.

The time for putting in soft-wood cuttings is from the first of June until the last of September, the sooner after the first of June the better, as the weather is not so hot then, and the early rooted plants in many cases can be planted out in frames and make good strong plants before frost. Make the cuttings two to three inches long. Lath screens are needed for the outside shade, on inside white cotton cloth. The cuttings should never be allowed to wilt, and when collecting them it is always well to have the watering-can with you. Put in cuttings from one to two inches apart, according to their sizes. Give a good watering to settle the sand, and

shade during hot sunshine for the first week or ten days, when you can gradually dispense with the inside shade, but will still need the outside screen in very hot weather. Damp down the floor several times a day to keep the air moist. In growing plants from root-cuttings the roots are to be cut up in lengths of from two to eight inches, according to the habit of the plant. They can be tied in bundles, right end up, and laid in damp sphagnum moss until they show signs of growth, or planted in beds, boxes or pots of sandy soil. They need to be kept moist but not too wet, until they have started; they do not require shading as soft cuttings, but need the same treatment as growing plants. As soon as large enough they need transplanting and care. Other shrubs, like some of the Roses, some Spiræas, Lilacs and others have stolons, tubers or underground stems; these can be cut up and treated the same as root-cuttings.

Many evergreens can be grown from cuttings, such as Thuya retinosposa, Cedar, Junipers, Dwarf Spruce, Cephalotaxus and Yews. It was not thought possible a few years ago to grow Piceas from cuttings, but by selecting the young sides growth Picea Engelmanni and pungens can be grown from cuttings of their own wood. The best cuttings of most conifers are the ripened upgrowth of the last years taken off with a heal on it, that is for the Spruces, Firs and Yews. The Junipers, Arborvitæs and Retinosporas take the small side branches. The best time to take off cuttings of evergreens is in the fall and early winter just before the hard frosts begin. While they will root at other times, the more difficult ones are best taken in the fall. When first put in they need to be kept quite cool until they callous, when more heat can be given them. The time of rooting varies with the species, many of the Arborvitæs and Retinosporas rooting in a few weeks and some of the Junipers in a year or more. The cuttings should be put in well drained pots or boxes, or in the case of a large establishment a whole bench can be reserved for them. The cuttings in most cases should be small, not more than a few inches in length. Evergreen cuttings are impatient of too much wet; nothing will rot them quicker. A temperature of 45 to 50 is high enough until they

are well calloused. While they do not require as much shade as soft cuttings, a little shade the first few weeks is beneficial. After they are well calloused they will not need any; after having rooted their treatment should be the same as that of other plants.

Many plants that are difficult to propagate by cuttings and are wanted on their own roots can be had by layers. This is probably the surest way for an amateur, but it is slow; but by layering, many plants are had on their own roots which would be almost impossible to get any other way. Layers are branches of trees or shrubs either twisted or cut half-way through and buried in the earth several inches, but not detached until they are rooted. Clematis, Magnolia, Rhododendron, Rose, Maple, Lindens, Halesias, Quinces, and in fact almost any plant can be layered. Some root easily in a few weeks and others take several years. Some layers, such as Clematis, Grape-vines and Wistarias, can be layered at every few eyes as fast as they grow, but this kind of layering needs to have the sap checked at every place. You put it in the ground either by cutting half-way through on the stem or twisting the branch so as to check the flow of the sap. In most of the nurseries abroad, and some in our own country, layering is carried on to a great extent. The part of the nursery devoted to layering is usually called the stove ground. Here two plants or sometimes several are planted in groups three, four or more feet apart and layered every year or every other year, as the case may be. Young clean wood of the previous year is usually considered the best, so the plant is grown and pruned so as to produce as much straight growth as possible; they are then bent down, turned or twisted or not, as the case may be, and covered up with soil, and if the growth is too rank the tops are pinched or pruned so as to regulate the sap. In very dry seasons or in the case of choice plants these layers are kept well watered and cultivated. It is not always necessary to have a stove ground, for any branch or vine can be brought down and the soil and conditions made good around it, and success is sure to follow. The Magnolias, Maples, Rhododendrons, and other hard-wooded plants usually have to remain

on the parent plant two years, while Clematis, Grapes, Roses and other quicker rooted plants are cut off from the parent plants in the fall and healed in till spring or planted in the nurseries. As soon as the rooted plants are taken from the stools, a good dressing of manure is spaded in around the mother-plant and it is pruned and trained for another season's growth. Layering can be done any time, but spring or early summer is the best time. By layering such plants as Viburnums, Cornuses, Hydrangeas, Loniceras, and others, salable plants can be had in one season.

GRAFTING.

To go into the details of grafting would be more than one could do in a short paper. All trees can be grafted, and it is by grafting that many curious forms of trees are perpetuated, as well as most of our fruits. Many old orchards can be regrafted with new species or varieties, thus renewing what otherwise would be of no benefit. By grafting, weak varieties can be made stronger by grafting on a more vigorous stock; others can be dwarfed. New varieties can be tested by top-grafting on old trees, and seedling fruits be brought to early bearing by the same process, thus saving years of time. To grow an apple or pear from seed to fruit requires a great number of years, but by top-grafting on old trees only a few years. Thus you can quickly find out your work of hybridizing, and if the variety is worth anything whole orchards of it might be in bearing condition before the original plant was. It is not well to graft where a tree can be produced equally as well and quickly by other means. As I said before, I do not think grafted plants live as long as those on their own roots, although there are some cases where grafted plants have done much better than seedlings and are less liable to disease.

There are many kinds of grafting, I think Baltet gives nearly fifty, but they are all a modification of one another, and four or five ways would be all that is necessary in practical work. Almost every propagator has his favorite; still those methods practiced by skilful propagators are best, and may be summed up

as follows: inarching, bottle-grafting, cleft-grafting, side-grafting, crown-grafting, splice, tongue or whip-grafting, root-grafting and veneer-grafting. The best season for grafting outdoors is in the spring, when the sap is in motion, from March to June; under glass, with half-ripe wood, from August to the last of September; and December to the last of March with dormant wood. Midsummer grafting either in or out doors is not a success. In all kinds of grafting it is better to have the stock started ahead of the scion. A calm atmosphere and a warm temperature is more conducive to success than a cold, wet one. The tools necessary are a good saw, budding knife, grafting iron, pruning shears, a bunch of raffia or wax cloth to keep the grafts in place, and grafting wax to cover the wounds with and keep out the water. All scions should be cut before the sap begins to flow rapidly, from January to the middle of March. Many plants with slender stems are injured by freezing; these should be cut in the fall before heavy frosts and kept in sand or moss in a cool pit or cellar. For future use I find this especially applicable to hybrid Roses when the wood is wanted for winter use. A great loss of grafts is sure to be the result if the wood is not thoroughly ripened and collected before being hard frozen. All scions, if possible, should be of medium growth and of well ripened wood a year old. In some cases, such as Oaks, Hickories, Birches and Beeches, two and even three years old wood often takes better than that of one year old.

Inarching, or grafting by approach, is without doubt the most ancient of all grafting methods. From time to time Nature gives us examples of it in roots or trees that have become united where they have been bruised or pressed together. Man was no doubt quick to perceive and take advantage of this hint, and when once tried, improve upon it. A few years ago almost all our Camellias, Azaleas and other hard-wooded plants were worked in this way and in many continental nurseries it is still in use. The time for inarching out-of-doors is from early spring until July or August, while the tree or shrub is in active growth, and as the scions are still attached to the parent plant they can be inarched in either a woody or herbaceous state. The sim-

plest method is to remove from both stock and scion a thin slice of the bark and —— from two to three inches long, then bringing both cut surfaces together in such a manner that they will fit exactly, tie firmly with bass or raffia and cover the wound to keep out the air, although this is not always necessary.

Another kind of inarching is similar to tongue-grafting. An incision is made in the stock and the scion, and the two are bound together. In grafting by approach the trees or plants must be in close proximity to each other. The plants to be worked must be either planted around the stock tree or in pots and so arranged on stoves or stands as to be easily brought in contact with the branches of the stock tree. When the graft has taken hold cutting it from the parent stem is an important matter and should not be done too hurriedly. Make a small incision at first, increasing it from time to time until the final separation, which may require several weeks.

Bottle-grafting is only another method of grafting by approach. The lower end of the scion is inserted in a bottle of water to keep it in good condition until the cut surfaces are united.

Cleft-grafting was practiced at a very early date and is a method much in use now to top-graft old trees in orchards or to renew individual trees as well as young stock that have become too large to bud. In cleft-grafting the stock is cut off with a saw at a point at which to insert the scion, then smooth off the surface, then with a grafting iron or knife split the stock through the centre, being careful to divide the bark at the same time so as to leave the part smooth. The scions are then cut wedge-shaped and fitted into the cleft one on each side, making sure that some part of the bark may come together. In large stocks it is not necessary to bend the graft before watering, but in shorter ones it brings the points in closer union. March and April are the usual months for grafting out-of-doors.

Side-grafting. This term is applied to a number of processes of grafting in which the head of the stock is not cut away. The most simple side-graft is that in which the scion is cut with a long splice perfectly smooth and thin to the bark: then from this stock a thin strip of bark and wood two or more inches in

length is cut. Fit the barks exactly together and bind firmly. This is a favorite method of grafting Azalias and Camellias, and should be done under glass.

Crown-grafting is very similar to cleft-grafting. It is practiced in spring as soon as the bark is easily separated from the wood, the stock being headed down several weeks before the time of grafting. The scions should be cut with a flat sloping cut on one side, but instead of splitting the stock the bark is divided from the top downward and lifted as in budding. The scion is then inserted under the bark. A small implement of wood or ivory made in the form of the scion can be used to advantage in preparing a place to insert the scion.

Tongue or whip grafting is the method most commonly used in nurseries. For grafting young fruit-trees where the stock and scion are nearly equal the scion is prepared with a long sloping cut and the stock in the same manner. A small cleft or split is made about midway of the cut portion of both stock and scion; these are joined together and bound with waxed cloths, then healed in boxes of sand or earth and planted out in spring, leaving one eye above the surface.

All methods of grafting can be used on root-grafting. The Peony, Begonia, Wistaria, Rose, Clematis, Dahlia and many others can be successfully worked on roots.

Side-grafting is one of the best methods of propagating hard wood under glass and can be practiced from November to April and from August to October. In this mode of grafting all plants should be potted the spring before. In grafting select a smooth place on the stock and with a sharp knife make a slight cut downward in the stock and slightly into the wood, then insert the blade two or more inches above, cutting off a thin slice of the wood down to the cross cut. A corresponding slice is taken off the scion. They are then fitted together so the two meet, tied firmly together and placed in closed frames in the greenhouse slightly sprinkled overhead when necessary. The frames must be kept closed the first few days, but as soon they begin to unite more air must be given and gradually harden them off.

Budding consists in taking a bud with a portion of bark

attached to it and inserting in some portion of another tree. In order to do this a longitudinal incision is made through the bark of the stock to the wood; a cross cut is then made at the upper end, forming a letter T, into which a bud previously prepared is inserted. Some remove the inner bark and some retain it. I do not think it makes much difference. The best buds are those in the centre of the stem. As soon as scions are cut the leaf-blades should be removed, leaving a small portion of the leaf-stalk, which facilitates the handling of the bud. When the bud is fitted bind it with bass above and below, leaving only the bud and this leaf-stalk exposed. Most of our nurserymen practice budding more than grafting as it is a much cheaper way of getting up stock than grafting.

In the propagation of plants by grafting it is fully as necessary to know the kinds of stock to work on as it is to know how to perform the operation. All Pines with five needles, like Cembra pervifolia and others, do well on P. Strobus. The Scotch and Red Pine will do for all the other Pines. Picea pectinata and P. balsamea will do for the Silver Firs, Retinospora and Arborvitæ for all the varieties of the Arborvitæ Thuja, common Hemlock for all its varieties, Red Cedar for all the Junipers, common Larch for all Larches, Euónymus Europeus for all Euónymus, the Locust for all species of Robinia, Caragana Aborescens for all Caraganas, Viburnum Dentatum and Opulus for all Viburnums, Ulmus Compestris for all English Elms and Ulmus Americana for American varieties, Quercus Rubra for all Oaks, Betula Alba for Birches, English Hazel for all species and varieties of Hazel, Mazzard Cherry for Standard and Mahaleb Cherry for Dwarf, Prunus Americana and Mirabelle make good stock for all Peaches, Plums, Nectarines, and Apricots, Pear for standard Pears, Quince for Dwarf Pears, Clematis Flammula and Paniculata for all Clematis, Dwarf Magnolia Tripetala and Acuminata for all Magnolias, Honey Locust for all species and varieties of Gleditschia, Vitis Labrusca and V. Aestivalis for Hardy Grapes. Pyrus Toringo is the best stock for all flowering Apples. There are others that need special stocks, but I think this list serve for most of the plants in this section.

2nd March, A. D. 1899.

ESSAY

BY

Mrs. DELIA F. COREY, Northboro, Mass.

Theme:—The Early Education of Children.

In attempting to say anything on this subject, I realize that many great minds and hearts have given their best strength to it, and what can I hope to do with so great a theme save to bring together the results of the investigations of others with perhaps a few thoughts of my own! The child is a being of three-fold nature, and must be treated as such in our efforts to bring him to most complete maturity. Considered and developed as either a physical, an intellectual, or a moral being simply and the result is a deformed thing pitiful to see.

I believe the tendency of the present day is to treat the child as an intellectual being simply. Public instructors and educators seem anxious to learn new methods of instruction and to acquire greater skill in developing the mental power, and but little is said of the physical, and less of the moral, nature. Mr. Anagnos once said in a lecture that from what he had learned of our schools he was convinced that American children were hurried into and through subjects that they could not digest in their school life; and it is true that we begin the process of training with our little ones while they are yet babies, sending them to kindergarten at any age between three years and five and continuing till, as we say, they are finished—in academy or college. Many of our girls are so nearly finished in our high schools that it is rare to find one whose bodily health has not become somewhat impaired; at least, as we say, she has become

nervous. Does it seem as if Whittier could have referred to American girls when he wrote of girlhood

> "With its solid curves
> Of healthful strength
> And painless nerves."

As a race the Americans have developed a nervous energy, perhaps by generations of living in this country that has proved a splendid possession, not only in the development of the *country* but of the *race*. We need not be surprised, then, at its appearance in the children, but we must remember that, unduly excited, it will react upon a feeble or immature body to its injury. Do we act wisely in our attempt to follow the sturdy Germans in providing kindergarten schools for our nervous American babies?

It seems to me that a good wholesome letting alone, as far as mental stimulation goes, during the first seven or eight years of life might be a benefit to us as a people. Such a course must result in fewer pale, puny, little children in our schools, fewer delicate, nervous boys and girls, and stronger men and women. The malady common to us, known among foreign physicians as Americanitis, would certainly receive a check. It is exceptional to find a strong, vigorous mind in a feeble body. When shall we lay the foundations of health and strength if not in childhood?

By my own observation I have found that a delicate child may be made strong by insisting upon abundant sleep, nourishing food, an out-door life, as far as our climate admits, and merry companionship during the first seven years of life, no intellectual stimulus pure and simple being allowed. A *healthy* child by this course lays the foundation of strong, vigorous maturity. It is generally believed that keeping the child from school till eight years of age makes him backward in his school work, but I am convinced that this is not true. A child of average ability, eight years old, easily takes the first two years' work in one year, and a quick, bright child can take the first three years. He is generally able also to combine the third and fourth, or fourth and fifth years.

During the time under eight, the child, though not in school, need not be idle. He is "near to nature's heart," and all that she has to reveal to his bright eyes and his active fingers are very real to him. Many and valuable are the lessons she will teach him on the beauty and sacredness of the life around him that will influence him all his subsequent life. The little child will learn much if left entirely to himself, but if a lover of nature can be his companion much more real good may be accomplished. It seems to me that it is not *necessary* that the teacher in this case shall be *proficient* in natural science, though better so, but it *is* necessary that he shall have a nature-loving heart. While a child looks upon a bird as something to call forth his skill in throwing a stone, or rabbits and squirrels as things to be trapped, beetles and caterpillars as something horrible, he is at variance with nature; he cannot understand her message. "Eyes has he, but they see not."

I have seen children rush to their teacher, a butterfly or wounded bird crushed in their little hands, with the air of a hunter bringing in his game, but when the teacher has taken the little creature, smoothed out the ruffled wings with tender hands and explained that it was suffering, the little man or woman was immediately anxious to do everything possible to relieve the pain, often much *affected* because of the injury done.

I fear that parents often underrate the value of teaching of this kind in the formation of kind and gentle traits of character.

The child may learn much of the character and habits of birds, insects, and flowers without knowing a technical term; and habits of keen, accurate observation may be formed that will prove invaluable in after life. It is a great thing to start right in life, in harmony with the environments in which God has placed us. When a little child has learned that the same great God that created and loves him, also made and cares for all about him, even the feeblest and tiniest; that life is a wonderful, a sacred thing to be guarded, not destroyed,—he is in harmony with nature and nature's God—he is ready for life. This truth may be and I think, *is best learned* under *eight years of age*, without greater stimulation of the intellect than is conducive to

the best physical development. It will be observed that all out doors is the schoolroom, that these fundamental truths come from his observations made in playtime, and that there is no suggestion of a task to be done. This kind of nature work should be carried on through every year of school life, with more and more attention given to details as the student advances. This kind of original investigation is invaluable in the formation of strong, self-reliant character. We take our pills as they are prepared for us, sugar-coated often, that we may not realize what we are taking, but the eternal truth cannot be taken in doses prepared by another, but in order that it become our very own, and really add to our strength, we must by our own efforts gain it.

In our town, we try to interest the children in the birds and flowers. We have those among our citizens, prominent among them Miss Edith Barnes, who addressed this Society recently, who are able and willing to give time for bird walks, which our teachers generally attend; and they, in their turn, take the children on similar excursions. Thus they become quite enthusiastic in watching for the return of our little songsters and in studying their habits during the summer. Perhaps the children are equally anxious to search fields and wood for wild flowers. I believe this an effort in the right direction, encouraging original investigation, and beneficial to the health.

Right here, perhaps, it will not be amiss to say that I most heartily approve the efforts of this Society in encouraging the study of our wild flowers by our women in their homes. I have been delighted to see two of my neighbors, young women, mothers of children, roaming over woods and fields with flushed cheeks and shining eyes, in search of the daintiest and rarest of our lovely wild flowers. And they took prizes, too, *several* of them.

I also approve, as a means of education, of the attempts of this Society to encourage children to cultivate flowers. I don't know what plan has been followed, but it seems to me I should try to have the gardening extremely simple in the beginning, taking the hardiest plants, like nasturtiums or petunias. If my

own little one were the gardener, I would see myself that she did not fail to have good results at first. It is so discouraging to a child, and, perhaps, to an adult as well, to fail; so hard to begin again or to love the work. The lesson learned of the necessity of being faithful every day are invaluable. The plant, then, that gives us the best return for a small outlay of time and skill,—a vine, a shrub, or a rose-bush,—anything that may be his very own to cultivate, and will probably do well in the care that he is able to give it, in my judgment, is the best for a beginning.

In our own family, we have given the boys a small hotbed, using small-size sash; or a piece of ground for a garden in which they raise lettuce and vegetables, send them to market and receive the returns for their own use. We have thought that this is a valuable experience, for several reasons that doubtless occur to you, as a means of education.

It is very important that our little children form right ideas of things—that they get the true view. We quote glibly enough, "As the twig is bent the tree's inclined." But when does the child cease to be a tender twig that can easily be bent? Does it not become more and more difficult to influence him after he has become associated with other and older children? You know how surprised and grieved a *little* boy is as he sees the older boys torment a dog, stone frogs, pull out the legs of flies and beetles, and the hundred and one things of that sort that children see opportunity to do. It is sad to see how soon even the tenderest-hearted little fellow among them ceases to be shocked and falls into line with the young ruffians. This is the beginning of the hardening process, extending through all the phases of ill treatment of companions and elders, disrespect for law and order, ending, in some cases, in the village or city hoodlum, with all his possibilities.

Now a little one, five years old—the age at which children are allowed to enter school—and a majority *do* start in at that age, has had neither time, ability nor opportunity to get any very definite conceptions of his relations to things about him. He is now preëminently a tender twig. If only he may be

trained upward into the sunlight of truth and right! Think of the power that comes into the hands of the older children whom he meets on the playground, to turn his life toward good or evil. (I do not mean that his character will be formed during the next three years, but I do believe it will receive a bent that will probably be followed.) How much of the time is their play supervised? Who knows what that older child is telling the little ones as they cluster around him in the sunny corner? I believe the city and village school-children are more fortunate than those of the country district-school in the respect of supervised playyards. These "ragged beggars sunning," generally in some secluded spot, often with no human habitation within sight or hearing, afford every opportunity to the bad boy or girl to vitiate the whole school. Thus isolated, the children are shut in to the influence which there prevails, whether good or bad. The homelife may be narrow, but there is little chance of help reaching them from the more cultivated centres. The closing of these outlying schools and bringing the pupils to the village is a blessing to the country children living on the outskirts of the town, in my opinion.

The village hoodlum is getting to be as grave a problem as the city tough, fully as much to be feared. Often he is not a foreigner, but a descendant of the first settlers, having had the advantages of country life and district-school training. Cowper may sigh "for a lodge in some vast wilderness," but it certainly is not a good place in which to bring up children, or to build a district schoolhouse. The attempt of some cities to provide playgrounds for the children during the summer by opening the schoolyards is good. It is *very* good, because suitable persons either volunteer or are hired to care for the little ones and oversee their play.

An ideal plan, it seems to me, for the early education of little children, that could easily be carried out in the country, but in the city would be a little more difficult, would be to have them enter school at about eight years of age. In the city, parks reasonably accessible to the children should be provided, not beautifully-kept parks, with smoothly-shaven lawns decorated

with signs "keep off the grass," nor gravelled walks, nor rare plants necessitating the employment of a gardener, but a piece of land like that used for pasturage in the country. A wall should be built around it that would secure quiet and seclusion as far as possible. In it should be planted wild flowers, in such nooks as would best suit each variety, and there they would blossom through spring, summer and autumn,—from arbutus to goldenrod. Trees should be set out,—Maples, alders, beeches, pines, birches,—*shrubbery*, such as we find growing by the country roadside; bushes and vines, such as we find in pastures. There should be water—either a pond or a brook—in some part of it. In short, it should be as full of wild plant and animal as well as insect life, as by any contrivance it could be made.

This could not be a public place, but must be kept as carefully from depredators as a schoolroom. During as many days of the year as possible, the little children under eight years of age should come in classes of a dozen or twenty, at stated times during the day, for an hour or two's walk and talk with a teacher provided by the school board. Any teacher who failed to awaken the interest, sympathy and love of the little ones for the life about them should be considered unsuccessful.

This plan could be followed in the country without the expense of preparing a park, as everything is there arranged by Mother Nature in the best possible manner. When a child has become acquainted with *life*,—animal, insect and plant,—has really seen it in the right way, has learned that animals suffer pain and fear when we are not gentle in our treatment, that they love and trust us when we are kind, that insects suffer, that their little life is easily destroyed, that plants are living beings, that with careless hands we may tear them from their home and they will die,—the thoughtless, even cruel treatment that so often helpless life suffers at the hands of children will be impossible. I have heard that the Romish Church says, "Give me the children till they are seven years of age and any one may have them afterwards"; and I fully believe that we should seize that most impressible period of a child's life to teach him

the truth concerning the rights and privileges of the life about him and his relations to it. Ordinarily, the child, in the first grades of public schools, is taught of animals by the use of pictures, and while pictures are much better than nothing, they are entirely inadequate.

It is possible for a little child to love the horse, cow, sheep, dog, or other animal in the picture, and to be entirely unacquainted with the living creature. Besides, while we are doing our best to teach the wonders of frog life, from the egg to the wonderful changes to froghood, Billy Jones has taught the boys always to approach the frog pond with stone in hand, to watch patiently for them and to aim well; in short, they have become persuaded that the frog has no other purpose in living than to furnish sport for the boys. Now B. Jones has a great advantage over the teacher, who has the pictures simply, for he presents the real object, rouses the keenest interest and enthusiasm, and thereby makes an indelible impression. Now, we want to take the little fellow while B. Jones scorns him, while his legs are too short to keep up with the fellows and his hand too little and weak to throw a stone with any chance of hitting anything that he aims at; we want to take him to the park to become acquainted with mamma frog and all the taddies, watch all the wonderful changes, and *develop* that interest that he will immediately feel in them.

You will readily see that domestic animals—the cow, horse, sheep, goat—could easily be made to feel at home in the park for a few days at a time, and the children would have opportunity to become acquainted with them. Foxes, raccoons, squirrels, mice, rabbits, etc., could also be accommodated in cages till the children could see and know them. Our birds, too, I am sure, would find their way to such a spot if only they could, in some way, be protected from the belligerent English sparrow. I know that the fairy tales illustrating kindness toward animals would be appreciated and enjoyed by children of this age, and they would be very helpful, too Plain, hard facts do not appeal to these little ones so strongly as facts clothed in imagery, be it ever so simple. To speak of a pansy,

for instance, as bright, beautiful, many-colored or fragrant, does not appeal to a child as to speak of it as a dear little face looking up into his.

As a teacher looks into a row of little faces, innocent, trustful, he realizes, as perhaps never before, the meaning of the words of Jesus, "Of such is the kingdom of heaven." How honest, earnest, consecrated the teacher needs to be who has the privilege of wielding so powerful an influence over the life at its beginning. Is there ever a more favorable time to bring them to the truth as expressed in the life around them, or, is there anything that appeals more strongly to the awakening consciousness of little children?

8th February, A. D. 1899.

ANNUAL REUNION AND SOCIAL GATHERING.

59th Anniversary of Organization and
57th of Incorporation.

Reception Committee, *President* O. B. Hadwen, *Secretary* A. A. Hixon, Col. Samuel E. Winslow, Calvin L. Hartshorn, Maj. F. G. Stiles, Hon. Nathaniel Paine, Charles Greenwood, Frederick H. Chamberlain, Frederick A. Blake of Rochdale, Hon. Henry L. Parker, H. F. A. Lange, John C. MacInnes, A. Swan Brown, Hon. F. A. Harrington, Hon. Ellery B. Crane, Prof. C. F. Hodge, Joseph Jackson, Henry B. Watts and John B. Bowker.

The guests and members began to assemble at six o'clock and they were welcomed by the reception committee in the library room, where the distinguished personages assembled, the rest gathering in the main hall, where Bicknell's Orchestra played a concert.

At 6.30 President Hadwen and Henry L. Parker, toastmaster for the evening, took their places at the head of the long column of people and marched up the stairs to the banquet room above, where C. S. Yeaw served the supper. The speakers and guests of honor took seats at a table along the north side and the other tables, at right angles to this, were filled by the main body of the company, which overflowed into the anterooms.

PRESIDENT O. B. HADWEN

began the after-dinner exercises with a welcome to members and guests. He gracefully drew a picture of the place Horticulture and its kindred arts have played in civilization.

He said in the past almost everywhere rough nature has been subdued and the earth has been moulded into forms of beauty. The roadsides and the homes of almost all classes testify to the increasing love for the beautiful in nature and show its ennobling influences. Each successive year shows a gratifying progress in the towns which surround our city.

I feel we are reaping no scanty harvest from the seeds of good works sown by the founders of this society. I feel this society is doing well its difficult work by encouraging careful discrimination in the search for perfection of culture. If we implant in the minds of the young a love and reverence for the beautiful in the nature about us we will have inculcated the best teaching that it is possible to give.

The period which has elapsed since this society was founded has been marked by the introduction of more important improvements in every direction than any like period of the world's history. Mr. Hadwen closed by introducing Henry L. Parker as toastmaster.

Mr. Parker said the members of the society take great pride in the fact that they own this hall, and that they can gather in so many representatives of kindred societies and states. Last year has been an eventful one. When we gathered last there were mutterings of war. Since then war has been fought and we have been ceded a vast amount of territory. What will be done with this territory, whether we help to provide for those countries a good government, or whether we keep them as a part of the United States, is a question yet to be settled, though the latter course is a consummation not devoutly to be wished. However, there can be no doubt the results of the war will be of immense consequence to horticulture. Of the 16,000,000 acres in Cuba, only 2,000,000 are under cultivation, and yet there can be grown there almost all the crops of the earth and grown the year around. All that is necessary to do is to tickle the crop with a hoe.

There are three horticultural societies represented here, which are the oldest in the country,—the Massachusetts, the Worcester and the Rhode Island Societies. It gives me pleasure

to introduce J. E. C. Farnham, President of the Rhode Island Society.

Mr. Farnham said the poet has told us that one touch of nature makes the whole world kin, and he felt the force of that remark anew as he looked on the faces of the people before him, who had participated in the same good fare. Horticulture has come to be a very important industry in the great marts of trade. From New York to California there are poured into our section the fruits of all the country. Trades focalize and come together, and we work each for all and all for each. I have been impressed with the strength of this Society. I congratulate you on the possession of this magnificent property. From this section of the country has gone forth the brain and brawn and intelligence and energy which has made the country what it is. Back of the industries we come back to the maiden soil.

B. P. Ware, of Marblehead, Vice-President of the Massachusetts Horticultural Society, spoke for that organization. We in Boston could not get up such an occasion as this, for we lack the social elements. You may be surprised when I tell you I used not so many years ago to team into Boston with a two-horse load of cabbages, and there met a Worcester man with a one-horse load of huckleberries, and we swapped loads. We are noted in Marblehead for our cabbage heads. Marblehead cabbages teamed all the way to Worcester was a fact only a comparatively short time ago.

You send your products down to Boston and beat out our farmers and other places, and there are a few market gardeners in Worcester who bring down to Boston stuff which always win prizes.

Samuel T. Maynard, Professor of Horticulture in Massachusetts Agricultural College at Amherst, spoke for the Massachusetts Fruit Growers' Association, which he called a child of the Horticultural Society. Prof Maynard defended the institution against a charge that the Agricultural College was doing much the same work as the other educational institutions of the State. The college has graduated 500 men, of whom 40 per

cent. are engaged in some line of agriculture. This low percentage is due to a public sentiment, even among the agricultural communities, that farming is a "low down" occupation. We need more students, and with our splendid equipment can accommodate 200 more. Send us some of that 200 and we will return them to you as well fitted for the business of life as the graduates of any classical or other institution of learning.

Postmaster J. Evarts Greene was introduced as a trustee of the public reservations. He gave an account of that institution's aims and what it has accomplished in preserving historic memorials.

John Farquhar of Boston said there is no doubt horticulture is on the forward march and New England is in the front rank. Mr. Farquhar said he wished the Massachusetts Society had as good a home in a central location as the Worcester Society. The progress of horticulture in the United States is shown by the exportation of vegetables to England, whereas the tide was running the other way a few years ago.

Clarence F. Carroll, superintendent of the public schools, of Worcester, spoke of the influence of horticulture as an educational force and a remedy for this great artificiality which is coming more upon us in the future. The threatening element in this artificial life is the tendency away from nature and the spontaneous growth. The two forces that will offset the dangers of over-civilization are the existence of societies like this horticultural society, which we should all try to co-ordinate with the public schools, and the public schools which should save us from artificiality and barrenness of life.

At 9.15 o'clock the speaking closed, and the party adjourned to the main hall for dancing. The platform was beautifully decorated with Palms, Ferns and flowers from the conservatories of Hon. Stephen Salisbury. The banquet tables were profusely decorated with bouquets and vases of Narcissus, Snap-dragon, Carnations, Hyacinths, Callas, Ferns, Roses, and Lilies con-

tributed by H. F. A. Lange, Fred. A. Blake, C. D. Thayer, H. B. Watts, A. W. Hixon, and others.

Committee in charge of dancing: Arthur J. Marble, Floor Director; W. K. Stanley, C. D. Thayer, Will. T. Allen, Fred. H. Hammond, Arthur Hartshorn, Henry Rich, Edward Watts, Aids.

Among the Guests and Members were: President O. B. Hadwen, Hon. Henry L. Parker, George Cruickshanks, Hon. Henry A. Marsh, Hon. Nathaniel Paine, Col. Samuel E. Winslow, Benjamin P. Ware of Marblehead, Warren C. Jewett and wife, Prof. Samuel T. Maynard, Amherst; Postmaster J. Evarts Greene, John Farquhar and wife of Boston; J. E. C. Farnham and wife, Providence; C. W. Smith, Supt. C. F. Carroll, Miss Stella Carroll, Principal Homer P. Lewis, Secy. Adin A. Hixon, John S. Baldwin, John H. Hemingway, John C. MacInnes and wife, Hon. Ellery B. Crane and wife, George Calvin Rice, Senator Francis A. Harrington, William Hart, Col. James M. Drennan and wife, John B. Bowker and wife, Hon. J. Lewis Ellworth, Miss Marian Knight, Miss Gertrude M. Parker, Miss Gooding, A. W. Andrews and wife, H. L. Adams and wife, W. P. Thayer and wife, S. T. Pierce and wife, H. W. Thayer and wife, Miss Keyes, Miss Sheldon, Miss L. Coulson, Miss Lowell, C. T. Foster, Mrs. Frank E. Holt, Charles E. Bond and wife, Mrs. A. D. Flagg, Miss Ellen M. Flagg, J. L. Estey, Mrs. George Estey, F. W. Hixon and wife, Charles E. Neale and wife, J. F. Thayer, Anna C. Svedberg, L. M. Woodman and wife, A. H. Gould, W. D. Ross, Miss Eldridge, Ed. J. Watts, Miss Florence E. Watts, M. E. Atherton, Charles D. Thayer, Maj. F. G. Stiles and wife, Lieut. Samuel Hathaway, Calvin L. Hartshorn and wife, Arthur J. Marble and wife, W. K. Stanley and wife, Miss Gracie H. Stanley, Miss Leola Goffe, Miss Sarah Gates, Allyne W. Hixon, W. I. Allen and wife, Mary C. P. Landers, Miss L. M. Hildreth, Isaac Hildreth and wife, C. B. Winslow and wife, Mrs. Thomas Ward, H. B. Watts and wife, Varnum P. Curtis, Fred E. Warner and wife, Fred L. Chamberlain and wife, Miss Luella E.

Potter, Frank C. Parker, W. J. Wheeler and wife, C. A. Ballou, E. A. Weeks and wife, H. Woodward and wife, Miss Gerry, F. A. Blake and wife, Hon. E. I. Comins and wife, Charles B. Eaton and wife, Oliver S. Morey and wife, Miss Grace A. Chamberlain, J. A. Smith, Miss Rena Ball, Ellis Brown, Miss Amy Perkins, Edward Jones, E. C. Henchman and wife, E. J. Allen, Henry Putnam, A. R. King, Charles H. Marble, Henry Marble, Norman B. Parsons, Miss Anna G. Parsons, Miss Sarah F. Bennett, Miss C. E. Bennett, Mrs. A. W. Darling, Clarence E. Johnson, Miss Bertha J. Whitton, Miss Amy Williams, Henry W. Moore, James L. Marshall, J. Neilson, F. B. Madaus, H. R. King and wife, George M. Coe, Herbert R. Kinney and wife, Mrs. C. B. Johnson, Chester F. Cutting and wife, Miss Marion Otis Midgley, F. H. Hammond and wife and Miss Hammond, Miss Myra L. Hammond, G. H. Foster, Mrs. Coulson, W. E. Sargent.

From out of town were: Ethelbert Bliss, Wilbraham; John G. Avery, Spencer; Augustus Pratt, Middleboro; E. A. Bartlett and wife, Shrewsbury; C. H. Green and wife, Spencer; E. M. Bruce and wife, Leominster; David L. Fiske and wife, Grafton; the Misses Fiske; A. G. Sharp, Arthur J. Hobbs, Pembroke, N. H.; J. Elton Green, Spencer; Abel F. Stevens and wife, Wellesley; Charles E. Parker and wife, Holden; S. D. Ward, Shrewsbury; W. U. Maynard, Shrewsbury; George McWilliams and wife, Whitinsville; H. A. Cook, Shrewsbury; E. W. Breed, Clinton.

9th March, A. D. 1899.

ESSAY

BY

ABEL F. STEVENS, Wellesley, Mass.

Theme:—New Methods in Horticulture.

Horticulture, the earliest employment of man, is also one of the most attractive. It is the poetry of agriculture! A taste for this delightful vocation is almost universal in this country. That garden in which Adam and Eve were placed was the primitive paradise; and to this day a tastefully arranged and judiciously planted garden, with fragrant flowers and delicious fruits, has still lingering about it many of the charms we are wont to attribute to the original Eden. And to every true lover of horticulture it seems, in the fulness of its summer beauty and autumnal fruitage, to be indeed almost a "Paradise Regained."

Among the most gratifying evidences of progress in horticulture, are the new methods in culture and the numerous acquisitions of new and valuable varieties of fruits, by which the season is greatly prolonged by the accessions of earlier and later varieties, by the better knowledge in the keeping and packing of fruits, and the facilities of transportation. Our markets and tables are now supplied with delicious fruits throughout the entire year, with such a variety as no other nation can produce! The progress of invention, the developments of science, and the spur of enterprise are indeed grand in other departments of industry, but in all this the fruit culture of our own dear State will have its full share. The great need of our horticulture today, in all of its departments, is "Brains": for the practical progressive cultivator who is up-to-date *must* be a man of

broad liberal education. He needs to know in a specific way the chemical elements of the soil, of his fertilizers, and fruits; he, therefore, should understand chemistry. He should be familiar with the structure of plants, the science of plant life, botany. It is required of him to know the habits of those insects that prey on his trees, and how to destroy them. As well should he know those insects that are aiding him in his labors, therefore must have a knowledge of entomology. In fact there is no employment on earth which calls for more broadly cultivated minds than the profession of horticulture. And we fully believe that our agriculture will never take the high rank that it is entitled to, until men everywhere recognize it as the "most learned of all the professions. And as that vocation upon the success of which depends the whole fabric of human society."

Fruit growers are the benefactors of the race. Who can estimate the importance and value as a factor in our national wealth, of a new variety of fruit which shall be adapted to all soils and locations of our rapidly extending cultivation? He who shall originate such a fruit should be held in remembrance as a benefactor of mankind. What greater temporal comforts can we leave to our children and friends than the fruits of the orchard and garden? What more valuable testimonials of a philanthropic life than the trees we plant for fruit for the future generations to enjoy? The man who plants a fruit tree is a benefactor of his day and generation!

CHARACTERISTICS OF GOOD FRUIT.

As all fruits are raised to eat, we must give the first place of honor to its *eating qualities*. Next in importance, is *durability*, or its keeping properties. The third requisite is *size*, which should be of good uniform shape, neither monstrous nor small. As beauty in form, as well as in color, will always be of great value in market fruit, brilliant colors will always charm the eye, although they may not gratify the taste. So in our endeavors to perfect new varieties of delicious fruits we must regard as the chief requisites: first, quality; second, value for general

cultivation; third, uniformity of shape; fourth, beauty of color. All of these special points of a good variety of fruit should be the standard of every grower.

All these, combined with vigor of growth, hardiness, and productiveness in the trees or vines, will be an invaluable acquisition to our list of standard fruits. As a rule, a variety succeeds best in the locality of its origin. There are two methods of producing new kinds; viz. by seeds and by hybridization. Let us sow the seeds of our best fruits. Also, with care, skill and judgment commingle the pollen of two of the best species and the production of a seedling from this union, and thus produce new and improved varieties.

HOW TO MARKET FRUIT.

There is always room at the *top* for the successful fruit grower, and there always will be.

There is no escape from over-production and ruinous competition, from every point, except through *higher* and *better production*. Raise fruit that readily catches the eye by its fine form and bright color, put it up in A No. 1 style, in neat, clean, new boxes or barrels, baskets or crates, all neatly stencilled with the grower's full name and fruit farm on each.

Always grade your fruit with care and courage, and never mix the grades in same package. Before putting in the fruit, place a piece of white paper, the same shape and size of inside of barrel head or box cover, with your advertisement as a fruit grower neatly printed upon it. Now face the first three layers stem downward and fill to the top with the *same* quality. In filling, shake often, round up the top and press firmly. Cover with another heading of printed paper. Secure firmly the head or cover. Now turn on the other end and stencil it with quality, variety, and address of grower. When the high quality of *your fruit* is *known*, it will *find* its *own buyer* and *command* its own *price!*

CULTIVATION OF THE SOIL.

To conserve moisture in the soil for the growth and development of the plants, for the disintegration of compact soil, to

enable the soil to absorb the rainfall more quickly, and maintain it nearer the roots of the growing plants, also to admit fresh air, and enable them to penetrate the soil, *these* are the primary reasons for cultivation. And the principal objects for subsequent tillage, whether by plow, harrow, or hoe, are to prevent loss of water by the growth of weeds, &c. Also to keep the surface covered with loose, dry mulch, in order to prevent loss of moisture by evaporation. The principles of good plowing seem to be almost one of the "lost arts," for as we see, in so many sections, the same old custom of plowing for successive years the same field at exactly the same depth. Thus forming a compact subsoil below the plow rendering it impervious to water, the injurious effects are twofold; viz., it makes it more difficult for the rainfall to be absorbed as rapidly as it falls, and increases the danger of loss of water and injury to the soil by surface washing and erosion of fields into gullies. These can be prevented by deeper cultivation and leaving the subsoil in a loose and absorbent condition.

SUBSOILING.

The *practical value* of which will be seen in the beneficial effect on the growing plants and increased crops, especially in the orchards and vineyards, as well as in the berry fields. The true principles of subsoiling. We would lay down for guidance these rules, viz.: it is rarely *necessary* in light, porous, sandy soils; it is not *beneficial* in heavy, wet soils *unless* they are previously and *thoroughly* underdrained; and it is likely to be *injurious* if much of the subsoil is brought to the top and incorporated into the surface soil, as it is generally sour, unhealthy and contains poisonous matter, which would be deleterious to plant growth.

The highest art of cultivation which has ever been practiced is that of trenching, so extensively employed in Europe and so earnestly advocated by all great agricultural writers. No known implement is so effective for loosing and improving the soil as the spade, as it does not *cut* the soil *from* the subsoil as the plow, but breaks it off and there is no compacting of the

soil *below* that point. Notice the difference of *tilth* of a *spaded* garden and of a *plowed* field. The ideal system of cultivation for our fruit-producing trees and plants can be made only by suitable implements specially adapted to the required work. We have found the best ones in the Steel Swivel Plow; the Pick-tongued Subsoil Plow; the Spading, Cutaway, and Acme Harrows; the Plank Drag; and Harrow-toothed Cultivator.

FERTILITY.

In maintaining proper fertility we attach great importance to the preservation of humus in the soil, as it performs different functions, which are of the greatest importance in crop production. For it influences the temperature, tilth, permeability, absorption, weight and color of soils, and controls to a high degree their supply of water, nitrogen, phosphoric acid, and potash. Humus is added to the soil by application of organic matter in the form of stable manures, decayed animal and vegetable matter. The marked difference between old wornout soils and that of new virgin soils—of the same character—is in the amount of humus which is present. In the decline of fertility the *loss* of humus is chiefly the cause, more than that of the removal of the essential fertilizing elements.

NITROGEN IN HUMUS.

The two most important points regarding the composition of humus are, the presence of nitrogen as a constituent, and the chemical union of the humus with potash, lime, phosphoric acid, forming humates. Good humus generally contains from 3 to 14 % nitrogen. It is also a means of supplying indirectly compounds which are essential as plant food, and combined with potash, lime and phosphoric acid this mineral matter so chemically combined is of fertilizing value. It is well known that stable manures are among the most lasting in its effect of any of the fertilizers which can be applied. This is due to the power which the manure possesses of uniting with the soil potash, phosphoric acid and lime, &c., to produce humates—which is also useful in making the inert plant food of the soil more available;

for it is estimated that an ordinary apple crop removes from an acre of soil about 50 lbs. nitrogen, 40 lbs. phosphoric acid and 75 lbs. potash. This amount, yea more, must be *returned* to the soil *annually* to supply the trees with food to produce full crops of fair smooth fruit.

ORCHARD FERTILITY.

For apples and pears give a liberal dressing, 10 cords per acre, of good strong stable manure in November, evenly on surface extending far beyond the outer branches, and alternate the next November with one ton wood ashes or 300 lbs. muriate of potash, and 500 lbs. fresh ground bone. The great advantage of early fall manuring of our orchards is found in the strong and vigorous bud and spur development in bearing trees and in all that rich, luxuriant growth of foliage in the following spring and summer, for the reason that the rains soon dissolve the mineral salts and carry them down in the soil, where the millions of rootlets *feed* the trees and plants. For the peach, plum and cherry trees use a compost of swamp muck, one year old, that has had a liberal mixture of fresh lime and salt well incorporated. Now, at the time of applying, to the above add 300 lbs. potash and 500 lbs. fresh ground bone. Notice we apply to all stone fruits nearly double the amount of phosphoric acid to perfect the pits; a very essential point in producing high class fruit for market or storing for future sale.

ORCHARD CULTURE.

In all young orchards of apples and pears, and in *all* orchards of peach, plum and cherry trees, always keep the entire surface clean from all grass and cereal crops. Do *not* plow deep, but use the Wheel-Cutaway and Acme Drag Harrow. Start cultivation as early in Spring as possible, have all the soil in good tilth, and by April 20th sow 12 lbs. clover seed mixed as follows: 4 lbs. red, 4 lbs. Alsike, and 4 lbs. American grown crimson. Cover with smoothing harrow and roll down smooth. Now, if you do not have sheep or hogs to turn into and feed down this clover crop in July and August, then plow under

when in full blossom and roll down firmly to conserve moisture. Do not cultivate after Aug. 1st, so the young growth will ripen up in early fall Now in our old apple orchards when the trees have attained their full size, we seed down to clover and blue grass, and pasture sheep or pigs up to harvesting of crop, then apply the annual dressing as above. If we stock heavily with sheep or pigs and feed them with heavy grain rations this stock will supply nearly sufficient fertility for the trees.

PRUNING.

We call your attention to a few of the principles in plant physiology, upon which the practice of pruning depends. In the general structure of trees and woody plants, practically there are four general groups of tissues in the trunks and branches, viz. :

1. *Bark;* forming the outer coverings.
2. *Cambium;* is the thin slimy layer or sapwood between bark and sound wood.
3. *Wood;* that forms the greater portions of the stem, trunk or branches.
4. *Heart or Pith;* which makes up the center of the trees.

The experienced grower has learned by observation to adapt his system of pruning to the above fundamental principles of plant growth. Of the above tissues, the cambium is the most important, as this is the vehicle of carrying the life sap from root to branch ; it is also the method of adding growth to the tree or plant ; it is the most delicate substance of the tree fibre, for it is almost cellular tissue. Pruning is the most valuable method of directing and controlling the energies of trees and plants. In all pruning the fact should be ever kept in mind that the leaves make nearly all the food used by the living cells of a tree, for if the foliage is removed the cells must undergo a process of starvation until new leaves are formed. In the natural shedding of leaves or twigs, which is nature's pruning, a layer of corklike cells is formed, so when the leaves fall the process of healing is very soon completed, but in the death and decay of branches they must be removed at once before rot

producing fungii and bacteria develops and decay spreads into the sound wood, and will produce a cavity into which water and decay will soon destroy the tree. Let all such branches be cut off close down to the shoulder or enlargement at their base, so that the living cambium and bark will heal at once and soon cover over the WOUNDS. If the branch to be removed is large have the wound painted over as soon as *dry* with warm coal tar, and the internal rotting will be prevented. If in removing a large dead or decayed limb that leaves a large cavity in the trunk of the tree, cut close and smooth, then cover the cavity with a sheet of zinc neatly fitting the wound, secured with strong tacks, and paint over with coal tar. This practical method will preserve for many years a valuable tree. This system of pruning equally applies to park, street and ornamental as well as to orchard trees.

A fruit tree should be in the hands of an expert grower—a machine for manufacturing fruit. Pruning is one of the most important means by which this is accomplished.

PRUNING TO SHAPE THE TREE

and keep in shape is important so far as it relates to the ease in cultivation, gathering the fruit, and spraying; also in relation to winds, the weight of fruit, the protection of the trunk and branches from sunscald, &c.; also the pruning to distribute growth, removing cross-branches and checking terminal branches to induce the development of laterals. This will keep the tree vigorous and well supplied with thrifty fruit-producing branches. The balance between vegetative and reproductive growth, or between wood and fruit, must be maintained.

Always remember to cover all wounds at once after pruning with shellac varnish, liquid grafting wax or warm coal tar. If these wounds are small and on sound young trees, the shellac and wax is best, but if large and decayed use the tar covering. As pruning is a surgical operation it should be done with care and judgment and at proper seasons, as the true theory is based on the conditions of the sap. As this is the life-blood of the tree, never prune when the sap will run or

moisten the saw. We have seen many a fine orchard ruined, yea destroyed, by being severely pruned in March, April and May. Now the right time to prune depends on the object in view. For vigor and growth, prune during the dormant period of fall—October and November—but never when the wood is frozen, as the cellular tissues are ruptured and incipient decay begins. Now for stimulating fruit buds prune the rampant summer growth of terminal branches, which checks the vigorous flow of sap and diverts this energy into fruit production. In a word, prune in *Fall* for wood, in *Summer* for fruit.

THINNING FRUIT.

By a new method of pruning we do much of our thinning out of inferior fruit. This can be done in January instead of July. All commercial orchardists acknowledge the fact that to produce first-class marketable fruit that the crowded specimens must be thinned. Now during the busy season of mid-summer when the fruit is one-half grown, the average fruit-growing farmer has too much other work on hand, just at this important time in the rapidly developing fruit, to take the necessary time and care to properly thin out the surplus fruit. And I am sorry to admit that too many of them belong to that class who often are heard to say "I kinder reckon that enuff of them apples will fall without us helpen 'em before they git ripe." Now every progressive grower *will take* time to properly thin out, so as to produce the very best in size, color and flavor that is possible for the tree; about six inches apart, will give the best crop for profit. Now my new method of winter pruning is a successful and expeditious means of accomplishing this indispensable work by pruning or thinning out all the weaker spurs of fruit buds that are set too thickly on the branches.

MY METHOD

is as follows: during the mild warm days in December and January, we firmly secure to a long pole for a handle a small and sharp-pointed key-hole saw. Also, for inside tree pruning have another saw in a shorter handle. Also, fasten a thin and

very sharp two-inch chisel in similar pole for handle. Now with these practical tools and a Waters' "tree pruner" we can rapidly go over a large apple-tree, thinning out all the weak and those too close to each other, the fruit spurs. Now with care and good judgment in using the above tools and rapidly removing the surplus spurs, we find very little summer thinning of the apple and pear necessary. While the remaining fruit spurs receive so much more nourishment that they are decidedly stronger and produce larger, fairer, and higher colored fruit. Brother Fruit Growers, our new method is practicable. The necessary tools recommended are easily obtained, are very effectual in practice, and the results very gratifying. May success attend your efforts along these lines.

PACKAGES FOR FRUIT

should be of a uniform size and shape. The "Massachusetts Fruit Growers' Association" should demand the enactment of a State law defining the "Legal Standard Apple Barrel and Small Fruit Package." For all will concede that the amount of a product delivered should be the same as has been sold. No one will defend giving short weight or measure. Yet in our leading markets we find apple barrels differing more than a peck in their capacity, and the so-called quart packages which require forty to hold a bushel. Such conditions demoralize business, and react upon the whole community of fruit growers, as it does on the individuals. The "American Apple Shippers' Association" have recommended as a standard apple barrel the following, viz.: "Length of stave 28½ inches, diameter of head 17⅛ inches, and bilge 64 inches outside measurement." We find even greater dissatisfaction in the use of small fruit packages, for so much difference in sizes exist that it has already seriously injured the business of the grower, makes trouble for the dealer, and gives great dissatisfaction to the consumer. A legal standard should also be adopted for peach baskets and grape crates. Let a special committee of this Society be appointed to report at our next meeting, "An Act to Define the Size of all Fruit Packages."

In coming years may the hillsides and valley of the old Bay State be adorned with young, vigorous, fruitful orchards and fields, and we again have all the standard fruits in the same abundance as in their pristine days. Let us go on planting seeds and raising new varieties to replace the excellent kinds that are so fast disappearing, having filled their mission like the noble men that planted them! When I reflect upon the progress of horticulture and its benign influence on the health and happiness of mankind, I am most grateful to those noble men who did so much to help the cause in its earliest days. And by their laborious sowings we are now reaping such rich rewards and enjoying the fruits of their toil, which contributes so much to our happiness and welfare today! Let us in our day and generation contribute something to the shrine of "Pomona" that will be beneficial to those who may come after us! For as we have enjoyed what others have planted, let us now plant for others to enjoy.